**Weibei Industrial Zone, Xi'an Lintong modern industrial group energy island I water reuse project**

**The project proposal**

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# 1 Overview

## 1.1 District overview

Xi'an Weibei Industrial Zone a modern industrial group Lintong district is located in north of the Weihe River, is the important initiatives of "Guanzhong - Tianshui" Economic Zone Development Plan, planning area of ​​51.03 square kilometers. The size of recent construction of park land is 13 square kilometers, which can accommodate 13.3 million, the land areas: north to Maling village, south Weihe River levee, east to East Wei River village, west of North Town township. Recent construction area includes the central area of ​​the park and general support services dedicated equipment manufacturing industrial park, noble style communities and part of riparian ecological residential area. Regional east, west, south, north four roads have been built, namely King of Qin one, king of Qin two, Weishui one road, Weishui six road. The south of recent construction area adjacent to the Weishui river, on the riverfront in planning appropriate ecological green land for recreational functions; residential and commercial land donimated in center, which is the supporting center for the park development; the northern planning an industrial land which is the starting land. According to production integration of the city's construction concept and timing, the park will first build industry clusters to promote local business development and improvement of living facilities.

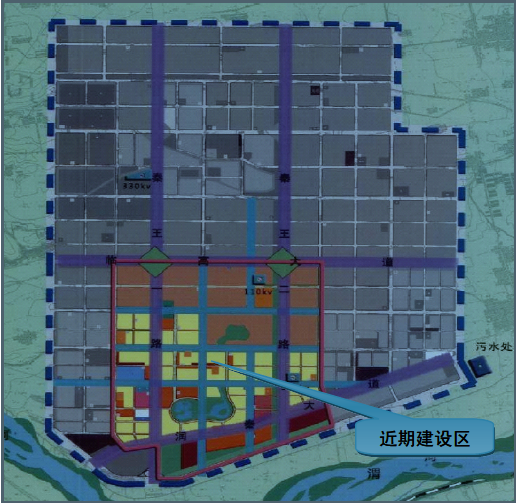


Figure 1.1 Lintong recent construction of modern industrial group

## 1.2 Preparation basis

(1) Policies and Regulations

"Energy saving" Twelfth Five-Year "Plan"

"Interim Provisions on the development of private water utilities."

"The State Council on Promoting the reform of water prices to promote water conservation to protect water resources of the notice"

"Shaanxi Provincial Development Program water-saving society."

"Twelve Five Shaanxi comprehensive energy reduction program of work."

"Shaanxi Provincial Water Conservation Measures"

"Xi'an urban sewage treatment and recycled water use regulations."

(2) Park Planning

"Xi'an Weibei (Lintong) Modern Industrial City Master Plan" (2010-2030)

"Weibei Industrial Zone, Xi'an Lintong modern industrial group controlled detailed planning"

"Xi'an Environmental Protection" Twelfth Five-Year Plan "and the 2020 Plan"

"Weibei Industrial Zone of Xi'an Lintong modern industrial group Drainage Plan"

"Detailed planning Weibei Industrial Zone of Xi'an controlling - Lintong modern industrial groups (review draft)" in the Water

Recycling plan

(3) Industry standards and specifications

"PRC Water Pollution Prevention Law"

"Surface Water Quality Standard" (GB3838-2002)

"Urban sewage treatment plant pollutant discharge standard" (GB18918-2002)

"Sewage discharged into the city sewer water quality standards" (CJ3082-1999)

"Integrated Wastewater Discharge Standard" (GB8978-1996)

"Outdoor drainage design specifications" (GBJ14-87)

"City sewage treatment plant sewage sludge discharge standard" (CJ3025-93)

"Urban sewage treatment project construction standards" (2001)

"Urban Water Supply Engineering Planning" (GB50282-98)

## 1.3 Project Overview

(1) Name

Lintong modern industrial group energy island I water reuse project

(2)Proposed location:

The site is located fourth Qin Wei Road intersection with the southeast corner of the island is located in the energy I sewage treatment plant.

(3) Scale

"Detailed planning Weibei Industrial Zone of Xi'an controlling - Lintong modern industrial groups (review draft)," according to the water Use of renewable resources planning, more "to 2020, the urban sewage treatment rate of 95%, wastewater reuse water rate More than 40% "So:

1. According to "Detailed planning Weibei Industrial Zone of Xi'an controlling - Lintong modern industrial groups (review draft)," The total size of the park sewage treatment 113,000 m³ / d, and therefore the scale of long-term treatment for the 45,200 m³ / d.

2. According to the energy island I sewage treatment plant construction scale of 10,000 m³ / d, so the energy island I water reuse project construction scale of 04,000 m³ / d.

3. The water reuse construction scale is 4,000 m³ / d.

(4) Use of water:

According to the current development and construction of the park actual situation, this water can be used for construction projects in the park landscaping, roads, road sweeping, fire and building construction.

(5) water quality indicators:

a raw water: The water reuse project in the raw water to the island I energy a sewage treatment plant effluent A standard, its main water quality indicators in Table 1: Table 1 Energy IslandⅠwater reuse project inlet water quality valuation (mg / L)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Indicators | pH | CODcr | BOD5 | SS | TN | TP | NH3-N | oil |
| Density | 6--9 | ≤50 | ≤10 | ≤10 | 15 | 0.5 | ≤5（8） | ≤1 |

b Water: according to water use, energy island I was a sewage treatment plant effluent standards in the water treatment, water quality can be achieved. "integrated urban wastewater reuse urban Miscellaneous Water" (GB/T18920-2002), its main water quality Indicators, see table 2:

Table 2 Energy Island Ⅰ in effluent water reuse project valuation (mg / L)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No. | Item | Flushing | Road sweeping, fire | Urban greening | Vehicle washing | Construction |
| 1 | pH | 6--9 | | | | |
| 2 | Color | 30 | | | | |
| 3 | Sniff | Without discomfort | | | | |
| 4 | NTU | 5 | 10 | 10 | 5 | 20 |
| 5 | Dissolved solids（mg/L) | 1500 | 1500 | 1000 | 1000 | - |
| 6 | BOD5 | 10 | 15 | 20 | 10 | 15 |
| 7 | Ammonia（mg/L) | 10 | 10 | 20 | 10 | 20 |
| 8 | Anionic surfactant（mg/L) | 1 | 1 | 1 | 0.5 | 1 |
| 9 | Fe（mg/L) | 0.3 | - | - | 0.3 | - |
| 10 | Mn（mg/L) | 0.1 | - | - | 0.1 | - |
| 11 | Dissolved oxygen（mg/L) | 1 | | | | |
| 12 | Residual chlorine（mg/L) | Beginning 30min,≥1.0， Pipe network ending ≥0.2 | | | | |
| 13 | Total coliforms | 3 | | | | |

(6) Construction Period

1 year

(7) investment budget

Water reuse project investment of $ 2.4 million as shown in Table 3:

Table 3 water reuse project investment estimate table (unit: million)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NO. | Item | Process Equipment | Pipe | Electric | Auto control | Lightning and protection | Heating and ventilation | Supply and drainage | Civil works | Others | Total |
| **A** | The first part costs | **122.22** | **8.39** | **10.18** | **0** | **1.92** | **3.59** | **2.04** | **47.93** | **0** | **196.27** |
| 1 | Water pumping station | 23.96 | 1.2 | 6 | 0 | 0.6 | 0.6 | 0.12 | 8.39 | 0 | **40.87** |
| 2 | Coagulation tank | 6 | 1.2 | 0.6 | 0 | 0 | 0 | 0 | 14.38 | 0 | **22.18** |
| 3 | Microfiltration | 23.96 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **23.96** |
| 4 | Nanofiltration | 23.96 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **23.96** |
| 5 | Reverse Osmosis | 23.96 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **23.96** |
| 6 | Deep treat pumping stations | 2.4 | 1.2 | 1.2 | 0 | 0.6 | 1.2 | 0.6 | 8.39 | 0 | **15.59** |
| 7 | Touch pool disinfection and chlorination | 6 | 1.2 | 1.2 | 0 | 0.12 | 0.6 | 0.12 | 8.39 | 0 | **17.63** |
| 8 | The pump house | 12 | 3.6 | 1.2 | 0 | 0.6 | 1.2 | 1.2 | 8.39 | 0 | **28.19** |
| **B** | The second part costs | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **19.77** | **19.77** |
| 1 | Construction unit management fees | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.99 | **5.99** |
| 2 | Project Management and related service fees | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.4 | **2.4** |
| 3 | Quality supervision fees | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.2 | **1.2** |
| 4 | Preliminary work fee | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.4 | **2.4** |
| 5 | Health and Safety Assessment Fee | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.6 | **0.6** |
| 6 | Construction transaction fees | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.2 | **1.2** |
| 7 | Tender agent fees | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.4 | **2.4** |
| 8 | Budgeting fee | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.2 | **1.2** |
| 9 | Insurance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.2 | **1.2** |
| 10 | Acquisition costs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.2 | **1.2** |
| **C** | Reserve fund | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **6** | **6** |
| 1 | Basic reserve fund | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | **6** |
| 2 | Price contingencies | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| D | Circulating funds | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17.97 | **17.97** |
| **E** | Total investment | **122.23** | **8.395** | **10.19** | **0** | **1.92** | **3.595** | **2.04** | **47.935** | **34.765** | **231.07** |

(8) investment plan

In principle simultaneous construction and energy island I sewage treatment plant to meet the "Xi'an controlling detailed Weibei Industrial Zone Detailed planning - Lintong modern industrial groups (review draft) "in wastewater reuse rate requirements.

# 2. the necessity of the construction project

Urban water pollution is a major obstacle to the sustainable use of water resources for sustainable cities and urban economic development. Therefore, comprehensive treatment of urban sewage, the sewage discharge standards and implementations water reuse to minimize pollution of the local municipal sewage water environment is essential.

With the development of modern industry groups in Lintong, industrial enterprises continuously settled and put into production, the amount of sewage and pollutants will be a substantial increase, due to the Weihe River is a modern industrial group Lintong sewage water storage, the energy island I water reuse project is the Weihe River water an important part of pollution control. Thus, the full implementation of the Weihe River Basin Management Plan focuses on the promotion - sustainable development "Guanzhong-Tianshui Economic Zone," the economic and social development and the Weihe River has great significance.

Lintong modern industrial group in the transition zone of arid areas and wet areas, local water resources are not abundant, the park currently uses groundwater as a water supply, so the construction of this project will become an inherent requirement of sustainable development, while conserving groundwater resources, reduce dependence on external development of the park resources.

Wastewater treatment, water reuse is to encourage water-saving behavior of Shaanxi Province, Lintong water use requirements are clearly modern industrial group planning raised. A "phased subdivision" ideological guidance in the construction industry started nearby sewage treatment plant, can effectively reduce the investment in water supply network, to meet enterprise requirements under the premise of the government to achieve the water economy, reduce municipal investment companies and financial pressure water users, is conducive to the promotion of water-saving policy for the region's economic and environmental pressure.

# 3. Technology Plan

## 3.1 Treatment process

Because the energy Ⅰ Island sewage treatment plant effluent quality to meet the "urban sewage treatment plant pollutant discharge standard" (GB18918-2002) an A standard, its biodegradability is low, the water may be due to SS, color, turbidity Degrees, salt concentration, the concentration of E. coli and other indicators without excessive water reuse to meet the foregoing requirements, the water department Treatment process to be adopted Coagulation + Reverse Osmosis + UF disinfection process.

Water reuse project major structures are shown in Table 4:

Table 4 main structures in the water reuse project

|  |  |  |  |
| --- | --- | --- | --- |
| NO. | Item | NO. | Item |
| 1 | Water pumping station | 5 | Reverse Osmosis |
| 2 | Coagulation tank | 6 | Deep treat pumping stations |
| 3 | Microfiltration | 7 | Touch pool disinfection and chlorination |
| 4 | Nanofiltration | 8 | The pump house |

## 3.2 the construction site

(1) siting principles:

a water reuse project site should be combined with the overall urban planning and water supply planning.

b good engineering geological conditions.

c less demolition, accounting for less farmland, not disturbing.

d possible expansion.

e easy to use in the water;

f factory terrain is not flooded with good drainage conditions;

g transportation, convenient transportation, electricity, water and reliable.

(2) the project site:

Construction site in the Wei Qin Road intersection with the southeast corner of four plots in Figure 2, the water reuse project located Ⅰ Energy Island sewage treatment plant.

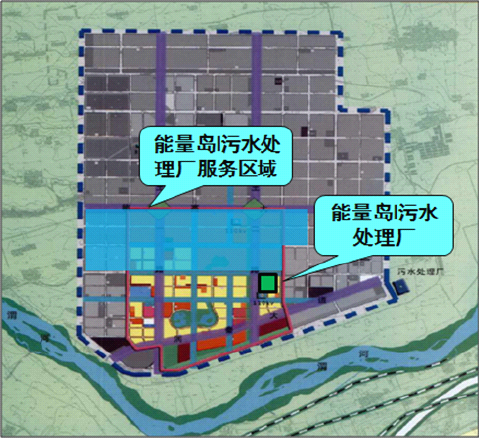


Figure 2 Energy Island Sewage Treatment Plant service area Ⅰ schematic

## 3.3 Water pipe network construction

Within the network of water pipes for the construction of the main building in the water side, the water in the water pipe network users to the main building of the park management committee, pipe network users Plant (Park) inside the main building of water users.

## 3.4 Water use and discharge pathways

(1) According to park development and construction of the actual situation at present, this water can be used for construction projects:

① Green Zone.

② roads, road sweeping, fire.

③ construction and so on.

④ row to the planning and construction of an artificial lake near future regional park doing landscape water.

⑤ integrated energy subprojects water, such as circulating water.

Recent construction range water: where daily water ① + ② approximately 1276m ³, the remaining 2724m ³ of water used in ③

+ ④ + ⑤

## 3.5 Staffing

Water reuse project will not increase personnel, operation, maintenance and management performed by the Energy Island Ⅰ sewage treatment plant staff.

# 4 Construction plans

Depending on the circumstances prevailing norms and construction period of the project, the whole project cycle from September 2013 to June 2015, including pre-business negotiations, technical preparation, project implementation and project commissioning phase of the three phases. The work program as follows:

## 4.1 business negotiations, technical preparation phase

· 2013 September 2010 - November 2013: project approval, preliminary project plan, environmental surveying, investment

Funding is estimated to start contract negotiations BOT projects

·2013 年 November to January 2014: Plan review, land use pre EIA preparation, feasibility study

Preparation, safety evaluation, the signing of the franchise contract.

## 4.2 the project implementation phase

·2013 年 November to February 2014: Implementation of design units and contracts, while mapping and ground

Exploration, equipment selection research, general plan approval, construction design, peripheral large municipal programs to determine (on Power, water, drainage, roads, etc.).

·2014 年 from February to December 2014: civil construction, equipment installation.

## 4.3 Project commissioning

·2015 年 01 months to June 2015: Project test run.

·2015 after 06 to: Project fully operational production.

# 5 Economic Benefit Analysis

## 5.1 Investment Estimation

(1) Investment estimates are based on

"Water Supply and Drainage Design Manual" (second edition)

"Water Engineer's Handbook"

"Sewage treatment plant design and operation" (2001)

"National unity municipal engineering budget quota tariff of Shaanxi Province" (2001)

"Municipal Engineering Investment Estimation indicators" (HGZ-47-104-2009)

"Project in Shaanxi province other fixed costs" (1999)

"Shaanxi Provincial Project Cost Management Information Materials Information price" (2008.6)

Wage labor costs by Shan Jian Fa [2007] No. 232 issued by the implementation of the text

(2) Estimated Investment Description

Including the handling process equipment and civil engineering and plant construction and other projects.

(3) Investment Budget

Table 5 Water reuse project investment estimate table (unit: million)

|  |  |  |  |
| --- | --- | --- | --- |
| NO. | Water reuse project | Project costs | Proportion |
| 1 | Project costs | 196.8 | 81.78% |
|  | Construction, municipal engineering fees | 64.8 |  |
|  | Equipment, industrial equipment and installation costs and acquisition costs | 132 |  |
| 2 | Construction and other costs | 19.2 | 8.23 |
| 3 | Reserve funds | 24 | 9.98 |
| 4 | Total investment | 240 | 100% |

## 5.2 operating cost estimates

(1) purchased raw materials fee: including production water, pharmaceutical consumption fees;

(2) power costs include electricity, etc.;

(3) maintenance fee of 1% of the original value of fixed assets accrued.

Operating costs are shown in Table 6.

Table 6 Water reuse project operating costs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| NO. | Expense items | Unit | Cost(10,000) | | Water | Notes |
| Month | Yrat | yuan/t |
| 1 | Materials fee | 10,000 | 0.47 | 5.6 | 0.04 |  |
| 2 | Power costs | 10,000 | 1.4 | 16.8 | 0.12 |  |
| 4 | Repairs | 10,000 | 0.15 | 1.82 | 0.006 |  |
| 7 | Totally treated water | 10,000m³ | 140 |  |  |  |
| 8 | Total |  | 2.02 | 24.22 | 0.17 |  |

## 5.3 Sales income

(1) Conditions of Sale:

① park management committee should ensure that the "detailed planning of Xi'an Weibei Industrial Zone Control - Lintong modern industrial groups (review draft)," 40% of the required amount of water back to the consumptive users, the project before implementation.

② park shall be the project of water production conducted security at the end, when the park actual consumptive of water shortage, the park should be guaranteed at the end, security at the end of water as follows: After the completion of the project to 12 monthly base water to 2800m ³ / d, the first 13 months to 24 monthly base water to 3200m ³ / d, the first 25 months to 36 months and the end of each operating year warranty after water was 4000m ³ / d.

(2) Sales revenue:

Table 7 Project sales revenue

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Item | Daily water supply | Price | Running days | Income | Notes |
| 10,000m³/d | yuan/m³ | Day | 10,000yuan |
| Water reuse project | 0.4 | 1.2 | 350 | 168 | Market price |

## 5.4 Project Financial Analysis

(1) Measurement conditions:

① in aquatic water: 04000 m³ / d

② running in a few days: 350 days

③ water treatment facility operating costs: Table 6

④ Project Investment Estimation: Table 5

⑤ Water Sales Price: 1.20 yuan / m³

⑥ estimated to be estimated as a 28-year operating cycle

(2) financial measure:

The project by the professional financial staff estimates, the results in Table 8:

Table 8 Water reuse project financial estimates table

|  |  |  |
| --- | --- | --- |
| NO. | Item | Financial Data |
| 1 | Total investment | 240 |
|  | Own funds(30%) | 72 |
|  | External financing(70%) | 168 |
|  | Average annual revenue | 168 |
|  | Annual operating costs | 38.6 |
|  | Annual gross profit | 129.88 |
|  | Average annual net profit | 102.01 |
| 2 | The total net profit | 2856.22 |
| 3 | Sales Gross Profit | 0.77 |
| 4 | Net sales | 0.61 |
| 5 | Internal Rate of Return | 57.64% |
| 6 | The payback period | 1.66 |
| 7 | NPV(calculated by 6.55%) | 1213.24 |

(3) Description:

① due to sewage treatment to an A standard cost of the park has been calculated at the sewage treatment stage, and by way of closing the sewage treatment fee has been recovered, so the water level of the financial measure calculated only A standard water to the water treatment costs . Therefore, the premise is to advance the construction of the water project construction of sewage treatment plants, sewage water treatment plant can be regarded as part of value-added benefits.

② According to the actual situation of the park predict the amount of water in a large park in the use of the main campus green, road, road sweeping, three fire and building construction.

# 6 Risk Analysis and Preventive Measures

## 6.1 Water Demand

Risk : the demand for water shortage . Although the city park planning water reuse purposes , but because of the demand for water has no rigidity and stability , making the water customers in developed as part of the water sales controlling .

Avoidance: Park Administrative Committee should ensure that the " detailed planning of Xi'an Weibei Industrial Zone Control - Lintong modern industrial groups ( review draft ) ," the basic conditions required in 40% of the amount of consumptive water back to the user as the implementation of the project , and park management committee to deal with security at the end of the production volume of water , when the park in the actual consumptive water shortage , the park should be guaranteed at the end, security at the end of water as follows: after the completion of the project to the end of the first 12 months guarantee water to 2800m ³ / d, The first 13 months to 24 months minimum guarantee water to 3200m ³ / d, the first 25 months to 36 months and subsequent Paul at the end of the year the water carriers 4000m ³ / d. Park land in the investment process to recruit the relevant environmental protection to be listed on stage Constrained corporate water reuse rate.

In the Park Administrative Committee on the basis of water security at the end of the production , with the water park users signed a " water purchase Agreement " if water exceeds minimum guarantee amount of water , the park management committee is no longer on the water reuse project subsidies, If the lack of security at the end of water quantity , water park management committee shall be the sales price of the item subsidies.

## 6.2 Stability of the water supply capacity

Risks: inadequate water supply capacity. ① Because the park is not uniform in the urban sewage output time distribution of emissions may appear unstable phenomenon, leading to instability in the water yield. ② Due to the expected development of the park and there is a certain gap, resulting in less water retention capacity of the sewage water at the end, which led to insufficient capacity in aquatic water, water water shortage phenomenon and thus appear.

Circumvention measures: ① build some tanks in the user usage and water quality. ② determine alternate sources of water. ③ first consider the stability of the water users in water user. Through the above three measures to smooth the water between sales and the yield difference, to avoid the risk of default in the water supply.

## 6.3 The water pipe network subsidies

Risk: the government does not subsidize the water pipe network. Water pipes larger network construction costs, if the government does not subsidize them, the water will greatly reduce revenue.

Avoidance: If the government does not subsidize the water pipe network, construction of the park by the water pipe network.

6.4 Water users too dependent park, water park without the use of large

Risk: Government pressure. Park bear the cost of water pressure, water pressure assume greater security at the end.

Avoidance: A conservative estimate the scale of construction, the park hosted the municipal water portion can run.

# 7 Social evaluation

## 7.1 Environmental Benefits

Through the implementation of this project, further to the ecological environment and water environment throughout the region to play an active role in the construction of the wastewater treatment plant will serve the basis of environmental benefits. In the wastewater treatment plant on the basis of emission reduction benefits: COD reduction in the amount of 70 tons increase, BOD reduction in the amount of 14 tons increase, SS reduction in the amount of 14 tons increase, NH3-N reduction in the amount of 7 tons increased saving 1.4 million m³ of water resources , thus achieving 40% of zero discharge of sewage. Further play a role in protecting and improving the water quality of Weihe River, improve the overall investment environment in the park.

## 7.2 Social Benefits

Construction of water reuse projects, to further improve infrastructure Weibei Industrial Zone of Xi'an Lintong modern industrial group, will improve the quality of the environment on campus, create a civilized industrial parks play an important role in health. Construction of water reuse projects, can greatly reduce the potential risk of disease outbreaks or epidemics, help to improve the quality of the urban environment, improve the city's image, will provide benefits to health and the environment on residents.

## 7.3 Economic benefits

Implementation of the project will have a wide range of local environmental impact, so that the development of industrial and residential sectors from the environment, resource constraints, the socio-economic development and environmental protection goals and coordinate for the park to provide quality play a positive investment environment effect. Nissan water if the whole public facilities for the park, the annual savings for the water park fee of about 5.04 million yuan.

# 8 Conclusion recommendations

1.Energy Island Ⅰ water reuse project design sewage treatment scale 04,000 m³ / d.

2.The energy island Ⅰ water reuse project treatment process using Coagulation + Reverse Osmosis + UF disinfection process.

3.The estimated energy island Ⅰ water reuse projects with a total investment of about 240 million. Project financial NPV is greater than zero, the higher internal rate of return, payback period is shorter, we can see that the project is feasible from a financial calculation.

4 Water production was 0.4m ³ / d, water sales price by 1.2 yuan / m³ calculation, the sales income of 1.68 million yuan of water / year can be achieved. The prerequisite for implementation of the project for the park management committee should ensure that the "detailed planning of Xi'an Weibei Industrial Zone Control - Lintong modern industrial groups (review draft)," 40% of the required amount of water reuse and consumptive users of the park water production sales carried guarantee.

5 Bbuilt energy island Ⅰ water reuse project will greatly reduce the pollution of the environment, both economic development and environmental protection initiatives, with good social, environmental and economic benefits. And can effectively alleviate the pressure in the water park development needs, reducing the park's dependence on external resources, providing favorable conditions for the healthy development of the park.