ENVIRONMENT NON TECHNICAL SUMMARY

MICHELIN SHENYANG PROJECT
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1.1 Executive Summary

1.1.1 Project background

As the biggest producer of tires in the world and also the pioneer of world tire industry technology, Michelin Group invented the innovative technologies and products including the radian ply tire account for 2/3 share in the tire leading-edge sector. It is also the inventor of green environmental oil-saving tire with lower rolling resistance. Since the presence of the first representative office in China in 1989, now it has 2 factories, one R&D company and 5 sales offices. At present it has a working staff of about 5500 employees all over China. Michelin Shenyang Tire Co., Ltd. was established in 1995 and is now the biggest production base of Michelin Group in China and its products cover car tires and truck-bus tires. For the past few years, Michelin Shenyang Tire Co., Ltd. is evaluated as foreign-invested enterprise with double excellence, one of the top 50 high-efficiency and top 100 foreign-invested enterprises with respect to paying local taxes and Grade A enterprise for commodity inspection in Liaoning and also an outstanding enterprise in Shenyang early or late. Over the last fourteen years after its founding it has successively been awarded many certificates of merit by Liaoning Provincial Government, Shenyang Municipal Government, Chinese Foreign-Invested Enterprises Association, All-China Federation of Trade Unions, Liaoning Federation of Trade Unions, General Administration of Customs, Liaoning Administration for Entry-Exit Inspection and Quarantine, Liaoning Department of Foreign Economic Relations and Trade, Liaoning National Taxation Bureau and Shenyang Local Taxation Bureau.

In the Plan for Reinvigoration of Northeast China made by the State Development and Reform Committee in August of 2007 it was proposed that Northeast China would be built into “a major manufacturing and export base of complete cars and parts across the country” and the tire industry would develop rapidly as a specialized supporting sector for the car
industry while the high performance radial ply tire was approved to be a superior foreign-funded enterprise by the State Council in December of 2008. The site of Michelin Shenyang Tire Co. Ltd is now surrounded by the residential quarters built in succession and not suitable for expansion in site. Michelin (China) Investment Co. Ltd intends to effect environmental relocation, renovation and expansion of Michelin Shenyang Tire Co. Ltd and build a new factory in the Chemical Industry Park in the western part of Shenyang with restructuring of product mix and adoption of more advanced production process and equipment to turn out high-performance radial ply tires for rapid development of China’s car industry and tire sector. The project investment amounts to US $ 1.52373 billion with a construction scale of annual production of 1.80 million truck-bus tires, 10 million car tires and 295,000 recapped treads. The construction of this project will create more than 1000 job opportunities, promote industrial restructuring and upgrading in Liaoning and make great contributions to rejuvenating old industrial bases in northeast China.

1.1.2 Briefing of the process of environmental impact evaluation

In accordance with relevant provisions in the Law of Environmental Protection of the PRC, the Law of the People's Republic of China on Evaluation of Environmental Impact and Decree No.14 of the State Environmental Protection Administration of China Classified Administration Catalog of Construction Project Environmental Protection, no new construction, reconstruction and expansion projects shall be authorized unless an evaluation of their impact on the environment has been conducted so as to clarify the impact of construction project upon the surrounding environment and ensure the realization of strategic goal for sustainable social, economic and environmental development. To launch the first-phase work of this project as soon as possible, Michelin Shenyang Tire Co., Ltd. has decided after consultation with Shenyang Research Institute of Environmental Sciences at the stage of intent to carry out environmental impact evaluation work with the project application report simultaneously.

As a result, Shenyang Research Institute of Environmental Sciences, to the requirement of Michelin Shenyang Tire Co., Ltd., began to collect data, analyze drawings and survey the site extensively and made preparations for environmental impact evaluation in line with relevant standards, regulations, specifications and guide rules for environmental impact evaluation.

On March 1-3, 2009, a field investigation of the site to be selected for the project and its surrounding environment was made.
On March 3-5, 2009, a field investigation of the production facilities, pollution source and EP facilities on the present factory site of Michelin Shenyang Tire Co., Ltd. was made.

From March 6 to 12, 2009, investigation of environmental quality status and additional monitoring were completed.


On March 24, 2009, Michelin Shenyang Tire Co., Ltd. entrusted Shenyang Research Institute of Environmental Sciences officially with the task of formulating the Environmental Impact Statement (EIS) for the Project of Michelin Shenyang Tire Co., Ltd. for Environmental Relocation, Renovation and Expansion of High-performance Radial Ply Tire Production.

On March 28, 2009, as required in the Notice of HF (2006) No.28 of the State Environmental Protection Administration concerning Distribution of Interim Measures for Public Participation in the Environmental Impact Evaluation, an announcement about environmental impact evaluation work was delivered in Liaoning Daily.

Special topics including in-depth engineering analysis, impact prediction and evaluation, argumentation of environmental measures and clean production were launched based on the technical information provided by the development organization and EIS was formulated.

On Apr. 28, 2009, the first draft and simplified edition of EIS were finished and submitted to development organization for examination and verification.

On May 4, 2009, the simplified edition of EIS were finished and an announcement was delivered in Liaoning Daily to conduct the second round of survey and feedback of public opinions and at the same time the EIS was revised.

On May 22, 2009, the EIS was finished and the draft EIS for approval was submitted.

1.1.3 Main conclusions of the EIS

This project is in compliance with national and local industrial policies, plan to relocate factory site in Shenyang Chemical Industry Park, and is in compliance with overall city development planning, after integral moving of surrounding residential area by Chemical
Industrial Park Management Committee, engineering environment sensitivity will reduce greatly, site selection and engineering plane layout are in keeping with environmental requirement.

The technical skill, equipments and management of this project are advanced, cleaner production level is higher; pollution prevention measure is reliable, all the waste gas, waste water, noise, solid waste can realize stable drainage standard and safety process; Projections show that the environmental influence of this item is less to water, weather and sound; and the big cuts of pollutant discharge gross can be realized, after move from place to place transform; the environmental risk of this item is lower, and have perfect prevention of accidents and contingency measure, environmental risk is at acceptable level; the public express support for this, and have no crosscurrent.

The non-local relocation and transformation of this project is not only far away from the densely-populated urban district and avoids pollution and disturbance in people, but also increases the production scale of high-performance and environmentally friendly radial tires through relocation and transformation and adjustment to the product mix; higher social, economic and environmental benefits will be achieved by equipping the new factory with new and hi-tech and equipment, replacing the old by the new, lowering material and energy consumption, effecting energy conservation and emission reduction, addressing the environmental issues cropped up in the factory and raising technical and managerial levels of pollution control in an all-round way.

1.2 Ground for Formulation
1.2.1 Relevant state laws, regulations and provisions

(1) Law of Environmental Protection of the PRC, Dec.26, 1989


(3) Law of the People's Republic of China on Promotion of Cleaner Production, Jan.2003

(4) Law of the Peoples Republic of China on the Prevention and Control of Atmospheric Pollution, April 29, 2000

(5) Law of the Peoples Republic of China on the Prevention and Control of Water
Pollution, Jun 1, 2008.


(7) Law of the Peoples Republic of China on the Prevention and Control of Environmental Pollution from Solid Wastes, Dec. 29, 2004

(8) Regulations on the Administration of Construction Project Environmental Protection, Decree No. 253, 1998 of the State Council;


(12) Plan for Reinvigorating Northeast China Area, State Development & Reform Commission, August of 2007;


(18) List of National Hazardous Waste Category, State Environmental Protection Administration No.1 Command. August 1, 2008.

1.2.2 Relevant local laws, regulations and plans

(1) Notice on Distribution of Interim Measures for Administration of Environmental Supervision of Construction Projects in Liaoning, LHF(2007) No.24;
(2) Eleventh Five-Year Plan for Circular Economy and Ecological Conservation in Liaoning, May of 2007;
(3) Notice on Related Issues concerning Strict Control of Total Discharge of Major Pollutants from Construction Projects and Intensification of Pollution Emission Reduction, LHF(2007) No.34;
(4) Regulations on Administration of Water Source Protection Area in Shenyang, Decree No. 12 Command of Shenyang Municipal People’s Government;
(5) Measures for Prevention and Control of Water Pollution in Shenyang Hunhe Urban Section and Water System around the City, Decree No. 35 Command of Shenyang Municipal People’s Government;
(6) Plan for Control of Total Discharge of Pollutants during the Eleventh Five-year Plan Period in Shenyang, Oct. of 2006

1.2.3 Technical base for evaluation

(1) Technical Guides for Environmental Impact Evaluation (HJ/T2.1-93, HJ/T2.2-2008, HJ/T2.3-93, HJ/T2.4-95 and HJ/T89-2003);
(2) Technical Guides for Environmental Impact Evaluation-Petrochemical Projects (HJ/T89-2003);
(3) Technical Guides for Environmental Risk Evaluation of Construction Projects (HJ/T169-2004);

1.2.4 Basic materials for impact evaluation
1.3 Purpose of Evaluation and Working Principles

1.3.1 Purpose of evaluation

On the basis of retrospective evaluation of existing production status of the enterprise and main pollutants to be discharged from this project, the extent and scope of the impact of the construction project upon the surrounding environment will be analyzed, environmental feasibility of the construction project and the technical and economic sophistication and rationality of measures against pollution will be demonstrated and a plan and suggestion for control of total amount worked out so as to offer grounds for the design of environmental measures and administration after relocation and expansion of this project.

1.3.2 Working principles

(1) The principles of energy conservation and emissions reduction, clean production, source control and carrying the old with the new will be implemented in an all-round way, a good job will be done in engineering analysis and pollutants will be generated and discharged to a minimum. In line with relevant provisions for environmental protection administration of construction projects, the principles of discharge up to the specified standard and control of total discharge of pollutants shall be followed.

(2) Information and relevant data available should be made full use of. In this evaluation relevant status information and data in this area will be utilized fully and the data will be screened and analyzed conscientiously to ensure their time-effectiveness and typicalness.

(3) Principle of practicability. Environmental impact evaluation will offer grounds for decision-making in environmental administration and directive opinions for implementation of environmental measures in the project.
1.4 Priority of the Evaluation

This evaluation will focus on retrospective evaluation of the project before relocation, engineering analysis, evaluation of the measures against pollution, analysis of clean production and analysis of control of total amount.

1.5 Goals for Pollution Control and Environmental Protection

1.5.1 Distribution of environmentally sensitive points

The planned area of the Chemical Industry Park is originally farm land and now part of it has become residence land and the rest is construction land.

Based on the plan for Shenyang Chemical Industry Park, the existing residential quarters in the planned area will be relocated completely and at present the relocation work is just underway.

The Hunhe-Puhe River Irrigation Channel goes through the middle of the Chemical Industry Park from east to west and the channel is now for irrigation of the downstream farm land. This project is located on the north bank of Hun-Pu Hunhe-Puhe River Irrigation Channel, 85m away from Hunhe-Puhe River Irrigation Channel. The Hunhe-Puhe River Irrigation Channel will supply water to the downstream farm land in the irrigation season.

The concentrated water source nearest to the factory area is Langjia water source located southeast of the factory area, about 7.5km away. The underground water in the area where the factory is located flows from northeast to southwest, not pointing to the direction of Langjia water source, therefore, Langjia water source will not serve as the target for environmental protection in this project.

The location of the Item has no environmentally sensitive points such as school, hospital, cultural relics, etc.

1.5.2 Target of environmental protection

For the targets of environmental protection in this project, refer to Table 1-5-1 and Figure 1-5-1.

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Category of protection</th>
<th>Name of protection targets</th>
<th>Specific location or distance from the nearest boundary</th>
<th>Remarks</th>
</tr>
</thead>
</table>

Table 1-5-1 Environmental Protection Targets
<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Category of protection</th>
<th>Name of protection targets</th>
<th>Specific location or distance from the nearest boundary</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Residential quarters</td>
<td>Qianma village</td>
<td>NE, 1.63km</td>
<td>1012 Persons</td>
</tr>
<tr>
<td>2</td>
<td>Residential quarters</td>
<td>Houma village</td>
<td>S, 0.86km</td>
<td>1778 Persons</td>
</tr>
<tr>
<td>3</td>
<td>Residential quarters</td>
<td>Sanmangniu</td>
<td>W, 1.36km</td>
<td>615 Persons</td>
</tr>
<tr>
<td>4</td>
<td>Residential quarters</td>
<td>Wenjiawazi</td>
<td>N, 0.3km</td>
<td>130 Persons</td>
</tr>
<tr>
<td>5</td>
<td>Residential quarters</td>
<td>Sitaizi</td>
<td>NE, 0.82km</td>
<td>4056 Persons</td>
</tr>
<tr>
<td>6</td>
<td>Residential quarters</td>
<td>Nanshan village</td>
<td>NW, 1.45km</td>
<td>625 Persons</td>
</tr>
<tr>
<td>7</td>
<td>Residential quarters</td>
<td>Xulinzi</td>
<td>NW, 1.41km</td>
<td>575 Persons</td>
</tr>
<tr>
<td>8</td>
<td>Residential quarters</td>
<td>Wangxing village</td>
<td>N, 1.46km</td>
<td>437 Persons</td>
</tr>
<tr>
<td>9</td>
<td>Residential quarters</td>
<td>Gongjiangbao village</td>
<td>NE, 1.91km</td>
<td>521 Persons</td>
</tr>
<tr>
<td>10</td>
<td>Residential quarters</td>
<td>Ermangniu</td>
<td>W, 2.4km</td>
<td>1072 Persons</td>
</tr>
<tr>
<td>11</td>
<td>Residential quarters</td>
<td>Daqing</td>
<td>SE, 1.46km</td>
<td>1590 Persons</td>
</tr>
<tr>
<td>12</td>
<td>Ambient air</td>
<td>Regional ambient air</td>
<td>Rectangle of 30km² with factory site as the center</td>
<td>GB3095-1996 Grade II in</td>
</tr>
<tr>
<td>13</td>
<td>Surface water</td>
<td>Xihe River</td>
<td>, 5.5km South, 5.5km</td>
<td>GB3838-2002 V Category V, GB3838-2002</td>
</tr>
<tr>
<td>14</td>
<td>Surface water</td>
<td>The Hunhe-Puhe River</td>
<td>85m South, 85m</td>
<td>GB5084-92 Water supply for paddy field</td>
</tr>
<tr>
<td>15</td>
<td>groundwater</td>
<td>Water well in the residential district</td>
<td>In the area of 32km² around the factory site</td>
<td>Domestic water</td>
</tr>
<tr>
<td>16</td>
<td>Noise</td>
<td>Sound environment in the area</td>
<td>1m beyond the factory boundary</td>
<td>GB3096-93 Category III in GB3096-93</td>
</tr>
</tbody>
</table>

1.6 Environmental Functional Zoning

For environmental elements and functional zoning in the area, refer to Table 1-6-1.

Table 1-6-1 Environmental Elements and Functional Zoning
<table>
<thead>
<tr>
<th>Environmental elements</th>
<th>Functional zoning</th>
<th>Grounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental air quality</td>
<td>Grade II, GB3095-1996</td>
<td>Functional zoning for air quality in Shenyang</td>
</tr>
<tr>
<td>Surface water quality (Xihe River)</td>
<td>Category V in GB3838-2002</td>
<td>Functional zoning for surface water in Shenyang</td>
</tr>
<tr>
<td>Underground water quality</td>
<td>Category III in GB/T14848-93</td>
<td></td>
</tr>
<tr>
<td>Acoustic environment quality</td>
<td>Category III in GB3096-2008</td>
<td></td>
</tr>
</tbody>
</table>

As Shenyang Chemical Industry Park is formerly a rural area, the standard for the area of Category I should be followed for noise pollution in the Park in line with the Division Map of Suitable Areas for the Urban Noise Pollution Standard in Shenyang (SZ(2003) No. 17). Now the area has been planned as an Industry Park by Shenyang Municipal Government, but the noise functional zoning has not been adjusted accordingly. In line with the Specification for Division of Suitable Areas for Environmental Noise of Urban Area (GB/T15190-94) Shenyang Chemical Industry Park falls into the suitable area for noise standard of category III and after certification by the local environmental protection agency the noise standard for the area of Category III shall be followed.
Picture 1-5-1 Environmental sensitive points layout for Construction program
1.7 Identification of Environmental Impact Elements and Screening of Evaluation Factors

1.7.1 Identification of environmental impact elements

Major production activities in this project cover:

① Construction works;

② Production of semi-finished products (mixed and calendered products): semi-finished products will be supplied for production of truck-bus tires, car tires and recapped treads;

③ Production of truck-bus tires;

④ Production of car tires;

⑤ Recapped tread;

⑥ Supply for the public works: water supply and drainage, power supply, cooling water circulating system, compressed air station, nitrogen station, spare gas-fired boiler and warehousing;

⑦ Administrative and daily life activities;

⑧ Existing enterprise relocation.

For major impact from production activities upon the environment refer to Table 1-7-1.

<table>
<thead>
<tr>
<th>Activities</th>
<th>Environmental elements under impact</th>
<th>Nature of impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Air</td>
<td>Surface water</td>
</tr>
<tr>
<td>Construction works</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Transport and feeding of powder lot</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Mixing, extrusion and vulcanization</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Industrial and domestic wastewater</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Treatment of solid wastes</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Supply for public works</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Conditions of accidents</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Old plant relocation</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

Short-term impact

Direct impact

Indirect impact
1.7.2 Screening of evaluation factors

Based on the environmental impact characteristics of this project, environmental elements and evaluation factors are determined as follows Table 1-7-2:

<table>
<thead>
<tr>
<th>Environmental elements</th>
<th>Status evaluation factors</th>
<th>Impact evaluation factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ambient air</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Residential district:</strong></td>
<td>SO(_2), NO(<em>2), PM(</em>{10}), NMHC, xylenes, CS(_2), styrene.</td>
<td><strong>Organized discharge:</strong></td>
</tr>
<tr>
<td><strong>Factory boundary:</strong></td>
<td>odor concentration, total non-methane organic compounds, xylenes, GS(_2), styrene and TSP</td>
<td><strong>Unorganized discharge:</strong></td>
</tr>
<tr>
<td><strong>Surface water</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Xihe River:</strong></td>
<td>pH, DO, COD(<em>{Mn}), COD(</em>{Cr}), amino-nitrogen, petroleum, phosphorus, trate nitrogen</td>
<td>COD(_{Cr})</td>
</tr>
<tr>
<td><strong>Groundwater</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation area:</strong></td>
<td>pH, amino-nitrogen, permanganate index, hardness, Pb, Mn</td>
<td></td>
</tr>
<tr>
<td><strong>Factory area:</strong></td>
<td>Pb, Cr(_{6+}), Hg, As, Ni, Cu, Zn, Cd</td>
<td></td>
</tr>
<tr>
<td><strong>Soil</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation area:</strong></td>
<td>pH, Zn, Cd, Pb, organic matter, petroleum, sulfate.</td>
<td></td>
</tr>
<tr>
<td><strong>Factory area:</strong></td>
<td>Cu, Cr, Pb, Zn, Cd, As, Ni, Hg, benzopyrene, etc. polycyclic aromatic hydrocarbon PAH, benzene series, BTEX.</td>
<td></td>
</tr>
</tbody>
</table>

**Continue 1-7-2 Schedule of Evaluation Factors**

<table>
<thead>
<tr>
<th>Environmental elements</th>
<th>Status evaluation factors</th>
<th>Impact evaluation factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acoustic environment</strong></td>
<td><strong>Factory boundary</strong> Leq</td>
<td><strong>Factory boundary</strong> Leq</td>
</tr>
</tbody>
</table>

1.8 Grade of Evaluation Work and Scope of Evaluation

(1) Atmospheric air

\[ P_i = \frac{C_i}{C_{oi}} \times 100\% \]

In accordance with relevant provisions of Technical Guides for Environmental Impact Evaluation HJ2.2-2008 the grade of atmospheric environmental impact evaluation should be determined in light of the proportion \( P_i \) of maximum ground concentration \( C_i \) of pollutants and discharge characteristics. The proportion \( P_i \) of maximum ground
concentration of each pollutant (i pollutant) and the farthest distance $D_{10\%}$ that corresponds when the ground concentration of i pollutant meets 10% of the standard limit shall be calculated, in which $P_i$ is defined as:

$$P_i = \frac{C_i}{C_{0i}} \times 100\%$$

Where

$P_i$—proportion of maximum ground concentration of i pollutant, %;

$C_i$—maximum ground concentration of i pollutant calculated by the estimation method, mg/m3;

$C_{0i}$—ambient air quality standard for i pollutant, mg/m3.

In accordance with provisions of Technical Guides for Environmental Impact Evaluation HJ2.2-2008 and Table 1-8-1 decide air evaluation grade.

<table>
<thead>
<tr>
<th>Evaluation grade</th>
<th>Graded proof of evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade I</td>
<td>$P_{\text{max}} \geq 80%$, and $D_{10%} \geq 5\text{km}$</td>
</tr>
<tr>
<td>Grade II</td>
<td>Others</td>
</tr>
<tr>
<td>Grade III</td>
<td>$P_{\text{max}} &lt; 10%$, or $D_{10%} &lt;$ the nearest distance from pollution source to factory bound</td>
</tr>
</tbody>
</table>

Based on the result of environmental analysis, the atmospheric evaluation work in this project is defined as Grade III. In consideration of the topographic features of the area where the construction project is located and prevailing wind direction for the average year, the evaluation of atmospheric environmental impact will cover a rectangular area of 6km×5km with the major pollution source—exhaust tubes No. 431 and 432 in mixing shop as the center, which is shown in Figure 1-5-1.

(2) Surface water

The sewage discharge amount from this project is about 449m$^3$/d, main of which are domestic wastewater and cooling water of equipment which can meet the Integrated Wastewater Discharge Standard in Liaoning (DB21/1627-2008) and pipe connection standard
of the sewage treatment plant in the Chemical Industry Park after digestion in the sewage tank, which will be linked to the sewage treatment plant in the Chemical Industry Park (first phase) for unified treatment and finally discharged into the receptor—Xihe River. Therefore in the environmental impact evaluation of surface water only an ordinary analysis is required and the main job is to analyze the possible effects of wastewater discharge in this project and acceptability of pipe connection standard upon operation of the sewage treatment plant in the Chemical Industry Park (first phase) in combination with the results of environmental impact evaluation of the sewage treatment plant in the Chemical Industry Park (first phase).

(3) Noise

This project is located in Shenyang Chemical Industry Park with acoustic environmental function of Category III. After completion of the project the noise level will be increased little. Moreover, beyond the factory boundary stand its counterparts without any noise sensitive target. Based on the requirements set in the Technical Guides for Environmental Impact Evaluation, the noise impact evaluation work in this project is rated Grade 3. The evaluation scope is 1m beyond the factory boundary. Noise evaluation factor: equivalent continuous sound level A (Leq).

(4) Environmental risks

The major hazardous matters in this project cover sulfur and gasoline, which are combustible without major danger source. Based on the principle of division of evaluation grade set in the Technical Guides for Evaluation of Environmental Risks in Construction Projects, the evaluation of environmental risks in this project is rated Grade II. The evaluation covers an area with a radius of 3km with the gasoline storeroom as the center.

1.9 Standards and Specifications Adopted

1.9.1 Environmental quality standards

(1) Ambient air

As the ambient air of the existing factory site and the planned construction area belongs to a function area of Category II, for quality evaluation of conventional pollutants in the air, standard for Grade II in the Air Quality Standard (GB3095-1996) is followed; For
characteristic pollutants including xylenes, carbon disulfide and styrene, maximum permissible concentration of harmful substances in the atmosphere of residential district set in the Hygienic Standards for the Design of Industrial Enterprises (TJ36-79) shall be reached. For environmental quality standard values of pollutants, refer to Table 1-9-1.

<table>
<thead>
<tr>
<th>Pollutants</th>
<th>Daily average</th>
<th>Hourly average</th>
<th>Executive standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen dioxide</td>
<td>0.08</td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>0.15</td>
<td>0.50</td>
<td>GB3095-1996</td>
</tr>
<tr>
<td>ISP</td>
<td>0.15</td>
<td>/</td>
<td>Standard for Grade II</td>
</tr>
<tr>
<td>TSP</td>
<td>0.30</td>
<td>/</td>
<td></td>
</tr>
<tr>
<td>Xylenes</td>
<td>/</td>
<td>0.30</td>
<td></td>
</tr>
<tr>
<td>Carbon disulfide</td>
<td>/</td>
<td>0.04</td>
<td>TJ36-79</td>
</tr>
<tr>
<td>Styrene</td>
<td>/</td>
<td>0.01</td>
<td>Maximum permissible concentration of harmful substances in the air of residential district</td>
</tr>
<tr>
<td>Benzene</td>
<td>0.8</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>Odor</td>
<td>/</td>
<td>20</td>
<td>With reference to unorganized emission concentration at the factory boundary in the atmospheric pollutant emission standard.</td>
</tr>
</tbody>
</table>

(2) Surface water

The water discharge of the existing factory site and the planned construction area will enter Xihe River, and the water quality evaluation of the surface water of Xihe River implement the standard for water bodies of Category V in the Environmental Quality
Standard (GB3838-2002) for Surface Water should be followed. Refer to Table 1-9-2.

<table>
<thead>
<tr>
<th>Item</th>
<th>pH</th>
<th>DO</th>
<th>COD_{Mn}</th>
<th>COD_{Cr}</th>
<th>Petroleum</th>
<th>Amino-nitrogen</th>
<th>Phosphate</th>
<th>Nitrate nitrogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard value</td>
<td>6—9</td>
<td>≥2</td>
<td>≤15</td>
<td>≤40</td>
<td>≤1.0</td>
<td>≤2.0</td>
<td>≤0.4</td>
<td>≤10</td>
</tr>
</tbody>
</table>

(3) Ground water

For ground water quality evaluation of the existing factory site and the planned construction area, the standard for Grade III in the Ground Water Quality Standard (GB14848-93) should be followed as shown in Table 1-9-3.

<table>
<thead>
<tr>
<th>Item</th>
<th>pH</th>
<th>Hardness</th>
<th>Permanganate index</th>
<th>Amino-nitrogen</th>
<th>Mn</th>
</tr>
</thead>
<tbody>
<tr>
<td>GB/T14848-93 Grade III</td>
<td>6.5-8.5</td>
<td>≤450</td>
<td>≤3.0</td>
<td>≤0.2</td>
<td>≤0.1</td>
</tr>
<tr>
<td>Item</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GB/T14848-93 Grade III</td>
<td>≤0.01</td>
<td>≤0.05</td>
<td>≤0.001</td>
<td>≤0.05</td>
<td>≤0.05</td>
</tr>
<tr>
<td>Item</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GB/T14848-93 Grade III</td>
<td>≤0.05</td>
<td>≤1.0</td>
<td>≤1.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(4) Acoustic environment

For acoustic environmental quality evaluation of the existing factory site and the planned construction area both belong to the Grade III, the standard for Grade III in the Acoustic Environmental Quality Standard (GB3096-2008) should be followed as shown in Table 1-9-4.

<table>
<thead>
<tr>
<th>Noise standard</th>
<th>day</th>
<th>night</th>
</tr>
</thead>
<tbody>
<tr>
<td>GB3096-2008</td>
<td>65</td>
<td>55</td>
</tr>
</tbody>
</table>

(5) Soil

For environmental quality status evaluation of soil in the region of planned construction area, the standard for Grade II in the Soil Environmental Quality Standard (GB15618-1995)
should be followed as shown in Table 1-9-5.

**Table 1-9-5 Standard for Evaluation of Soil Environmental Quality Status**

<table>
<thead>
<tr>
<th>Item</th>
<th>Grade</th>
<th>pH</th>
<th>Cd</th>
<th>Hg</th>
<th>Cr</th>
<th>Cu</th>
<th>Pb</th>
<th>Zn</th>
<th>As</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>Grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>II</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 6.5</td>
<td>0.30</td>
<td>0.30</td>
<td>250</td>
<td>50</td>
<td>250</td>
<td>200</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.5~7.5</td>
<td>0.30</td>
<td>0.50</td>
<td>300</td>
<td>100</td>
<td>300</td>
<td>250</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 7.5</td>
<td>0.60</td>
<td>1.0</td>
<td>350</td>
<td>100</td>
<td>350</td>
<td>300</td>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For environmental quality status evaluation of soil in the planned factory area, Environmental Quality Risk Assessment Criteria for Soil at Manufacturing Facilities (HJ/T25-1999) should be followed.

**1.9.2 Pollutant emission standards**

(1) Atmospheric pollutant emission standard

For industrial waste gas the standard for Grade II for new pollution sources in the Comprehensive Emission Standard of Air Pollutants (GB16297-1996) and standard for Grade II for new construction, reconstruction and expansion in the Emission Standard of Odor Pollutants (GB14554-93) should be followed, and existing boiler waste gas carries Standard of Boiler Air Pollution Discharge. For the emission standard values of each pollutant, refer to Table 1-9-6 a, b.

**Table 1-9-6a Emission Standard for Air Pollutants**

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Maximum permissible concentration(mg/m³)</th>
<th>Maximum permissible emission rate</th>
<th>Concentration at the monitoring site for unorganized emission(mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon black dust</td>
<td>18</td>
<td>36.5</td>
<td>4.96</td>
</tr>
<tr>
<td></td>
<td></td>
<td>35.5</td>
<td>4.72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24.5</td>
<td>2.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23.5</td>
<td>1.74</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.5</td>
<td>0.125</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>0.028</td>
</tr>
<tr>
<td>Other particulate</td>
<td>120</td>
<td>23</td>
<td>11.03</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
<td>12.74</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13</td>
<td>1.314</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>1.888</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>0.778</td>
</tr>
</tbody>
</table>

Invisible to the naked eye
<table>
<thead>
<tr>
<th>Pollutant</th>
<th>15</th>
<th>10</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Xylenes</td>
<td>70</td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>Benzene</td>
<td>12</td>
<td></td>
<td>0.40</td>
</tr>
<tr>
<td>Toluene</td>
<td>40</td>
<td></td>
<td>2.4</td>
</tr>
<tr>
<td>NMHC</td>
<td>120</td>
<td></td>
<td>4.0</td>
</tr>
<tr>
<td>Styrene#</td>
<td>/</td>
<td>15</td>
<td>5.0</td>
</tr>
<tr>
<td>Carbon disulfide#</td>
<td>/</td>
<td>15</td>
<td>3.0</td>
</tr>
<tr>
<td>Odor concentration#</td>
<td>/</td>
<td>24.5</td>
<td>5600(Dimensionless)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23.5</td>
<td>5400(Dimensionless)</td>
</tr>
</tbody>
</table>

Notes: 1. # Standard for Grade II for new pollution sources in the Emission Standard for Odor Pollutants (GB14554-93); For the rest Standard for Grade II for new pollution sources in the Comprehensive Emission Standard for Air Pollutants (GB16297—1996) shall be followed.

2. The emission rate of the exhaust tube with a height less than 15m should be decreased by 50% by the extrapolation method and the rate of the tube with a height more than 15m should be calculated by interpolation.

(2) Emission standard for pollutants in waste water

The waste water in this of the existing factory area and the planned construction area will be discharged after pretreatment in the sewage tank into Shenyang West Sewage Treatment Plant and Shenyang Chemical Industry Park for concentrated disposal and for the quality of discharge the Comprehensive Emission Standard for Sewage in Liaoning (DB21/1627-2008) shall be followed and for the standard value, refer to Table1-9-7.

<table>
<thead>
<tr>
<th>No.</th>
<th>Pollutant</th>
<th>Emission indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>COD&lt;sub&gt;Cr&lt;/sub&gt;</td>
<td>300</td>
</tr>
<tr>
<td>2</td>
<td>SS</td>
<td>300</td>
</tr>
<tr>
<td>3</td>
<td>Petroleum</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Amino-nitrogen</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>Sulfides</td>
<td>1.0</td>
</tr>
<tr>
<td>6</td>
<td>Styrene</td>
<td>3.0</td>
</tr>
<tr>
<td>7</td>
<td>Carbon disulfide</td>
<td>4.0</td>
</tr>
</tbody>
</table>
(3) Noise

For factory boundary noise of the existing factory site and planned construction area, the standard for Grade 3 in the Emission Standard for Industrial Enterprises Noise at Boundary (GB12348-2008) should be followed, namely, 65dB for diurnal and 55dB for nocturnal. For noise level in the planned construction period the limit value in the Noise Limits for Construction Site (GB12523-90) should be reached.

<table>
<thead>
<tr>
<th>Table 1-9-8 Factory Boundary Noise Standard</th>
<th>dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise standard</td>
<td></td>
</tr>
<tr>
<td>GB12348 – 2008</td>
<td></td>
</tr>
<tr>
<td>Grade</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Suitable area</td>
<td></td>
</tr>
<tr>
<td>Factory boundary</td>
<td></td>
</tr>
<tr>
<td>day</td>
<td></td>
</tr>
<tr>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Nocturnal</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table1-9-9 Noise Limits for Planned Construction Site Boundary</th>
<th>dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction stage</td>
<td></td>
</tr>
<tr>
<td>Earth and stone work</td>
<td></td>
</tr>
<tr>
<td>Bulldozer, excavator, loader, etc.</td>
<td></td>
</tr>
<tr>
<td>Diurnal</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td></td>
</tr>
<tr>
<td>Nocturnal</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td></td>
</tr>
<tr>
<td>Pile driving</td>
<td></td>
</tr>
<tr>
<td>All kinds of pile driver etc.</td>
<td></td>
</tr>
<tr>
<td>Diurnal</td>
<td></td>
</tr>
<tr>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Nocturnal</td>
<td></td>
</tr>
<tr>
<td>Construction prohibited</td>
<td></td>
</tr>
<tr>
<td>Structure</td>
<td></td>
</tr>
<tr>
<td>Concrete, poker vibrator and electric saw, etc.</td>
<td></td>
</tr>
<tr>
<td>Diurnal</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Nocturnal</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td></td>
</tr>
<tr>
<td>Decorating and finishing</td>
<td></td>
</tr>
<tr>
<td>Crane, elevator, etc.</td>
<td></td>
</tr>
<tr>
<td>Diurnal</td>
<td></td>
</tr>
<tr>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Nocturnal</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td></td>
</tr>
</tbody>
</table>

(4) Solid wastes

Standard for Pollution Control from Industrial Solid Wastes in Liaoning (DB21-777-94);
Standards for Pollution Control on the Storage and Disposal Site for General Industrial Solid Wastes (GB18599-2001);
Standard for Pollution Control on Hazardous Waste Storage (GB18597-2001)
2. Engineering Analysis

General Survey of the Construction Project

2.1 General characteristics of the project

(1) Name, place and nature of the construction project

Name of project: Michelin Shenyang Tire Co., Ltd. High-performance Radial Tires Environmental Protection, Relocation, Renovation and Extension project

Construction site: Michelin Shenyang Tire Co. Ltd is now located at No. 15, Shenxin Road, Shenyang and is designed to be moved to A-2 plot in Shenyang Chemical Industry Park (first phase). For details refer to Figure 3-1-1. The intended site is located in the western part of Shenyang, 8.5 km from West Third-ring Road and 10.7 km from the present site.

Nature of construction: relocation, reconstruction and expansion project.

(2) Construction scale and product program

Construction scale:

Truck-bus tires will be increased from 800,000/a to 1.8 million/a;
Car tires will be increased from 2.2 million/a to 10 million/a;
Retreaded (truck-bus tires) tires 295,000/a

Product goal:

The major goal of the project is to provide the Chinese market with Michelin and BF Goodrich competitive tires.

90% of the products will be sold at home market. BF Goodrich is the second biggest world brand of Michelin Group and its excellent performance enjoys great popularity in the market of leisure and land cruiser (4X4) products.

Export production is only for equilibrium between supply and demand in the three major continents (America, Europe and Asia). All kinds of tire may be exported, but the main export products cover business light truck tires and high-performance tires.

Product advantages:

The truck-bus products include tires with flat rim and those with drop center rims.

The design of each type of tire is integrated with the key technologies of Michelin to ensure the products have the greatest safety and durability in addition to special R & D aimed at the Chinese market. These include:
· The lowland drag technology is used to meet the need for long trailer with reduced fuel consumption and enhanced abrasion resistance.

- Special technologies are applied to cater to the need for road surface in different regions (icy and snowy surface, wet and slippery surface and slope surface) to achieve superb wear and driving performance with less fuel.

- The tread pattern with the best wear and durability is designed to the non-highway (construction site and country road) requirement so as to achieve better driving performance on the muddy surface with less fuel.

- Best wear is provided in view of the urban road surface requirements with fuel saved under the conditions of frequent stopping and starting on the urban road surface.

Apart from the design and production of new products, prevulcanized tread will also be produced for retreading of tire to achieve optimized utilization of tire case and prolong its service life, thereby reducing raw material and energy consumption and exerting a positive effect upon the environment.

(3) Plot area and plan layout

72hm² of land will be added to the project. For land-use indicator refer to Table 3-1-3. The total floor area comes to 586,463m². For specific buildings and structures, refer to Table 3-1-4. In the factory area stand two main exit and entrance, which are located on the west and east sides of the factory area respectively. Raw materials enter the factory from the west gate while products leave the factory from the east gate. Entrance and exit for man flow are on the south side of the factory area.

The factory area in this project is divided into two function zones to facilitate production arrangement and management in line with the requirements for technological process, production features, mode of transportation, fire control and work safety after consideration of natural conditions including local climate, hydrology and landform. For particulars refer to Figure 3-1-2 Plan Layout of Factory Area. The whole factory area is arranged from west to east in the sequence of production processes. On the west side stand in turn storage of raw materials, plasticating, mixing, finish mixing and calendaring while on the east side, extrusion, sheeting, forming, curing and inspection; power supply facilities like transformer substation, circulating cooling water and compressed air are located in the center of factory area near the load center. The administration area is on the east side close to the main road and is also upward under the side wind of the waste gas emission source of production facilities. Water is
led in from the middle of the southern factory area and sewage recycling facility and discharge opening are located on the southwest corner of factory area, which are connected to the cooling water tank and urban sewerage network respectively. The fire control waste water gathering tank and storm gathering tank are located in the southeast corner, connect with municipal rainwater network, set up diverter valves in fire-fighting wastewater disposal basins, water-delivery pumps stop flow at waste water vents of the factory area, the fire water tank is located in the middle of the south side.

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Item</th>
<th>Unit</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total plot area</td>
<td>m²</td>
<td>720,000</td>
</tr>
<tr>
<td>2</td>
<td>Plot area of buildings and structures</td>
<td>m²</td>
<td>295,499</td>
</tr>
<tr>
<td>3</td>
<td>Coefficient of building occupation</td>
<td>%</td>
<td>41</td>
</tr>
<tr>
<td>4</td>
<td>Floor area of buildings and structures</td>
<td>m²</td>
<td>586,463</td>
</tr>
<tr>
<td>5</td>
<td>Plot ratio</td>
<td>%</td>
<td>82</td>
</tr>
<tr>
<td>6</td>
<td>Plot area of road and square</td>
<td>m²</td>
<td>119,600</td>
</tr>
<tr>
<td>7</td>
<td>Greening area</td>
<td>m²</td>
<td>141,120</td>
</tr>
<tr>
<td>8</td>
<td>Greening rate</td>
<td>%</td>
<td>19.6</td>
</tr>
</tbody>
</table>

2.2 Technological route and production method

(1)Source of technology and product quality indicators

Michelin is the inventor of the radial ply tire. In this project the patented manufacturing technology of Michelin Company for radial car tire and all steel radial heavy truck tire will be used as the technology is advanced, mature and reliable; The main equipment is all imported abroad and the tire quality is superb and will meet the national standard of China, the U.S DOT standard and ECE standard in Europe. As a world top tire manufacturer, the Company has very strict internal control indicators.

In order to ensure the best product performance and the key technical targets, based on the traditional production, Michelin will increase more advanced production technologies and
On the production technologies, for rubber mixing, use the crushed natural rubber to increase the uniformity of mixing; Use White carbon black as a tread reinforcement material to increase the wear resistance and anti-collapse blocks etc.; Use environment-friendly type of accelerating agents to reduce the environmental pollution during the use. On the equipment configuration, rubber mixing uses a high-power mixer, preparation of semi-finished products uses composite extrusion process and rolling process, cutting and shaping use an automatic steel cord cutter and a tire molding machine in one time, vulcanization uses overheat water process d and N₂ process, detection line and testing equipments are supplied for the product inspection. Therefore, it reduces the procedures of the semi-finished part manufacture and turnover as well semi-finished storage space and tools and instruments, so curing thermal efficiency is high, curing pressure is stable, product quality is guaranteed. Tire key equipments related to the manufacturing technology closely are imported, such as rolling production line of steel cord cloth compound extruder, lining extrusion &rolling production line, steel cord cloth cutting machine, X-ray machine etc.


3.1 General Survey of Natural Environment

3.1.1 Geological location

The new factory site of Michelin Shenyang Tire Co., Ltd. is located within the scope of land used by Shenyang Chemical Industry Park (Phase I). Shenyang Chemical Industry Park is an integrated chemical industry park located beyond the Third-Ring Road southwest of Shenyang, 11km away from the West Third-Ring Road between National Highway No.102 and Beijing-Shenyang Expressway. Its planning scope extends to the Development Avenue in the north, Daqingduizi in the east, Dapan town in the south and Gaohua town in the west with a length of about 10km from east to west and average width of about 3km from south to north, covering a plot area of 30km². As a whole it is a rectangle running from northeast to southwest and Phase I project covers an area of 12.8 km² in the eastern part of Chemical Industry Park. The new factory site of Michelin Shenyang Tire Co., Ltd. is situated in Plot A-2 of the East Rubber Industry Area in the land for Phase I project of Chemical Industry Park with a plot area of 720000m². Now it is a space. In the Chemical Industry Park are built sound infrastructure facilities and public works as the support of this construction project. To the east of the factory site stands the boundary of the Chemical Industry Park and to the east
of CaiXing highway is the construction land (now unoccupied) of Shenyang Economic & Technological Development Zone. On the west side across Xihe River Qibei Street stands the fine chemicals industry area where Shenyang Xin Ocean Chemical Preparations Co.Ltd and Shenyang Gaobaode Chemicals Company are located; on the north side across Shenxisidong Road stand our counterparts-- Shenyang Heping Radial Tires Co. Ltd., Shenyang Sanxiang Special Tires Co. Ltd and the temporary boiler room of Datang International Power Generation Co. Ltd as the temporary power plant of the Chemical Industry Park; on the south across Shenxiwudong Road and Hunhe-Puhe River Irrigation Channel it faces Shenyang Sanxin Industrial Co. Ltd (southwest, metal products) and Shenyang Ruihua Tire Co. Ltd (southeast, retreading) , between which is a construction land under planning. For geological location of the construction project refer to Figure 3-1-1 and for regional location refer to Figure 3-1-2.

The site and location of the construction project is Shenyang Chemical Industry Park situated north of Hunhe alluvial plain, which is the near frontal area of Hunhe River new alluvial fan with a flat and wide terrain and single landform and the average elevation is 30.34m. As a whole the terrain descends from the north to the south and the east to the west, slightly sloping down from the northeast to the southwest. The landform is of the Hunhe River high flood plain type.
Figure 3-1.1b Geological Location Map of the Construction Project
Figure 3-1-2 Area Location Map of the Construction Project
Geological exploration of the plot for Phase I project of Chemical Industry Park and the factory area to be constructed indicates that with respect to the stratum, except for the upper layer of impurity fill, its lower part is composed of silty clay, medium sand, medium sand, silt, medium sand and grit. The stratal configuration within a drilling depth of 15 ~ 20m recorded in the data of 64 drilling holes is shown in Table 3-1-1, geological profile plan position in Figure 3-1-3 and geological profile structure in Figure 3-1-4.

### Table 3-1-1  Stratal Configuration of the Project Site

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Impurity fill</th>
<th>Silty clay</th>
<th>Medium sand</th>
<th>Medium sand</th>
<th>Silt</th>
<th>Medium sand</th>
<th>Grit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness (m)</td>
<td>4.6 ~ 5.6</td>
<td>0.2 ~ 3.6</td>
<td>1.2 ~ 8.5</td>
<td>0.6 ~ 7.1</td>
<td>0.7 ~ 2.1</td>
<td>Max. exposed thickness 11.2</td>
<td>Max. exposed thickness 3.6</td>
</tr>
<tr>
<td>Buried depth (m)</td>
<td>0.2 ~ 3.3</td>
<td>1.0 ~ 3.5</td>
<td>1.5 ~ 6.3</td>
<td>6.0 ~ 9.3</td>
<td>8.2 ~ 9.1</td>
<td>9.7 ~ 17.1</td>
<td>17.1 ~ 19.8</td>
</tr>
</tbody>
</table>

The location of the site has a seismic defense intensity of degree 7 with maximum frozen layer depth of 1.3m. The groundwater has a steady level of 27.20 ~ 27.30m with a buried depth of 2.40 ~ 3.80m. The area belongs to Quaternary alluvial layer with uniform geological combination without such unfavorable factors as landsliding, earth fall, karst and fault and the foundation bearing capacity is 180 ~ 200kpa.

#### 3.1.3 Climatic and meteorological characteristics

Shenyang lies in the semi-wet continental climatic zone of middle latitude, north temperate monsoon type. Its average annual temperature stands at 8.5℃ with January’s average minimum temperature registering -11.1℃ and July’s average maximum temperature at 24.6℃.

Average annual precipitation is 679.4mm, mostly concentrated in July and August. Average annual air pressure stands at 1011.2hPa with an average annual relative humidity of 63.1%.

The prevailing wind direction in the region is SSW all the year round with secondary wind direction of SW and in the non-heating period the prevailing wind direction is SSW with secondary wind direction of S while in the heating period the prevailing wind direction is N with secondary wind direction of S. Average wind speed reaches 2.90m/s with average maximum speed of 3.90m/s in April and minimum speed of 2.40m/s in August.
3.1.4 Surface water system

The surface water system in the evaluation region mainly covers Hunhe River and Xihe River.

The Hunhe River rises in the Gunma ridge, a branch vein of the Changbai Mountain in Qingyuan, Liaoning and flows through Qingyuan county, Fushun, Shenyang and Haicheng and converges with the Taizi River into Liaohe River and enters into the Bohai Sea at Yingkou. Hunhe River has a whole length of 415km with a river valley area of 1148km². After accommodating urban sewage from Fushun at the upstream reach, Hunhe goes into Shenyang territory at Xiaorenjing village, Dongling district, Shenyang and flows past Dongling district, south of the city, Yuhong district and Liaozhong county with a length of 172.6km for Shenyang section. Its main tributaries cover such natural rivers as Wangjiao, Mantang, Yangguan, Baita and Puhe as well as such artificial canals as Xihe river, South Canal and Xikai river. The release of Dahuofang reservoir from April through September every year will affect its flow and its average flow stands at $7 - 10\text{ m}^3/\text{s}$. 
Figure 3-1-3 geology location Map of the Construction Project
Figure 3-1-4 geology Map of the Construction Project
The Xihe River is a tributary of the Hunhe River with a length of 78.4km and rises in the western part of Lanjuntun along Shenyang-Sanhaiguan Railway and converges into the Hunhe river at Huanglatuozi, Liaozhong county. Its main function is to accommodate industrial and domestic sewage from the northern and western parts of Shenyang with a flow of $70 \times 10^4 \text{m}^3/\text{d}$. The Xihe River flows from the northeast to the southwest in the south of Chemical Industry Park with a shortest distance of 1.0km from the Park.

Moreover, in the middle of the Park the Hunhe-Puhe River Irrigation Channel crosses from the northeast to the southwest. The channel starts from Mojia sluice gate (near Shenyang-Dalian Expressway in Hunhe River) and irrigates the farmland along the downstream bank by drawing water from Hunhe River in the irrigation season.

The discharge from this project will first be directed to the sewage treatment plant in the Chemical Industry Park (Phase I) through the sewerage network and then into Xihe river after meeting the specified standard.

For the general survey of the water system in the construction project area, refer to Figure 3-1-5.

3.1.5 Hydrological geology

The ground water in the area is mainly Quaternary pore phreatic water and pore confined water. The pore phreatic water mainly occurs in the Holocene Stratigraphy sandy gravel stratum. According to the water pumping data, at a depth of 3.95m, single well outflow will come to $4700 \text{m}^3/\text{d}$ and buried depth of ground water level come to abut 12m. It is replenished through precipitation and penetration of surface water and the water level will vary with the season at a margin of 2m or so. The water bearing layer has a penetration coefficient of 80~100m/d and pore confined water mainly occurs in the Pleistocene sandy gravel mixed soil stratum and Upper Pleistocene sandy gravel. According to water pumping data, when the ground water in the Middle Pleistocene sandy gravel mixed soil stratum has a depth of 10.49m, single well outflow will come to $1614 \text{m}^3/\text{d}$ with a penetration coefficient of 50~60 m/d. When the ground water in the Upper Pleistocene sandy gravel has a depth of 8.08m, single well outflow will come to $1903.4 \text{m}^3/\text{d}$ with a penetration coefficient of 60 m/d.

3.1.6 Ecological environment

Types of natural vegetation and species of animal

Shenyang Chemical Industry Park is located in the western suburb of Shenyang as part
of Hunhe and Puhe alluvial plain of the Liaohe water system. Its vegetation flora is the vegetation and meadow area with one crop per year in the Liaohe Plain. The farmland vegetation is the major type of vegetation in the Chemical Industry Park and the variety of crop is insufficient. Only paddy rice is planted in the paddy field while corn is the main crop in the dry farmland. More vegetables are grown in the vegetable garden, but with less area of planting, accounting for 2.1% of the total only.

The main vegetation type in the area covers poplar forest, black locust forest, aloe community and planting community.

The Chemical Industry Park has a long history of development and boasts a dense population with convenient transportation and frequent human activities. Large wild animals have disappeared for long and only fresh water fish and birds dwell.

Soil
Figure 3-1-5 surface water system map

图4-1-5 地表水系联系图
The planning scope of the Chemical Industry Park and its surrounding area were farmland before. As the farmland was irrigated by the sewage discharged from Shenyang Metallurgical Works for a long time in the past, the land was severely polluted by cadmium. The monitoring results of the soil in the area by the environmental and agricultural departments show the soil is no longer suitable for planting farm crops and its production capacity of farm and sideline products is basically lost. With the approval of Shenyang Municipal Government, the area is selected to be the site for construction of Chemical Industry Park as the land there is level and without disaster factors, so is suitable for construction of the Park.

Land utilization

Within the scope of the land used for the Park (Phase I) all the land other than the residential area for relocation is to be used for construction.

3.2 General Survey of Social Environment

3.2.1 Social and economic conditions

Shenyang is the largest city in Northeast China and also the political, economic and cultural center of Liaoning province. For recent years our national economy has maintained a rapid growth trend. Shenyang is in the central position of the middle city cluster in Liaoning, Bohai Economic Sphere and Northeast Asian Economic Circle and also a major connecting point of the Circle with an important strategic position. Its superior geographical location-based environment makes Shenyang a bridge and pivot, through which the middle city cluster in Liaoning and Northeast China can enter the area south of the Great Wall or put out to sea to the whole country and world, thereby becoming the collecting and distributing center of capital flow, information flow, commodity flow and technology flow. Shenyang now boasts the biggest civil air port in Northeast China, which has now put 78 domestic lines and 16 international lines into operation. Shenyang has the biggest railway marshalling station and the One Ring & Five Radiation expressway network of top grade in the country, which has shortened the distance between Shenyang and its neighboring cities and ports. Traditional time-space concept has undergone qualitative changes because of improvements in transport and communications. The eight big cities in the middle of Liaoning with Shenyang as the center and basic and processing industries as the main part have formed a mid-Liaoning city cluster with abundant resources, mutually complementary structure and great technical association. As Shenyang Economic Zone is being constructed and shaped with Shenyang as the core, Shenyang will become a new region of economic growth across the country.
3.2.2 Transportation

Now no special railway line is available in the Chemical Industry Park, but highway transportation is convenient. In the region the highway is mainly XinCai highway and the neighboring highways include PanWu highway, ShenPan highway, (Provincial Highway No.102) and Beijing-Shenyang expressway. XinCai highway enters the Park area from the northeastern part of the Park, crosses Hunhe-Puhe River Irrigation Channel and joins ShenPan highway at Dapan town; ShenPan highway is located 900m to the south of the Park and PanWu highway located southwest of the Park directly leads to the planned road for the Park and joins ShenPan highway eastward on the west side of Dapan town; Beijing-Shenyang expressway located about 1.1km to the north of the Park has its entrance and exit at Gaohua town.

3.3 General Survey of Industrial Planning and Infrastructure Facilities of Shenyang Chemical Industry Park as the Location of the Project

3.3.1 Relationship with Shenyang’s Overall Development Plan

Shenyang Chemical Industry Park is one part of Shenxi Industry Corridor and one of the four function areas of Shenxi Industry Corridor, namely, Core Area of Advanced Equipment-Manufacturing Industry, Chemical Industry Area, Building Materials Area and Metallurgical Area. It is the industrial area that takes the lead in starting business within Shenxi Industry Corridor except for the Core Area of Advanced Equipment-Manufacturing Industry that has begun to take shape. For the planning map of Chemical Industry Park refer to Figure 3-3-1 and that of Shenxi Industry Corridor refer to Figure 3-3-2.

3.3.2 Planning scope and industrial positioning

The industrial chain of Shenyang Chemical Industry Park is composed of five major core industry chains, namely, petrochemical, coal chemical, chlorine and alkali chemical, rubber processing and fine chemical industries. The product chain in the Park is composed of three product chains, namely, methanol and deep processing product chain, CPP product chain and advantageous chlorine product chain, and three product groups, i.e., rubber processing product group, surrounding resources utilization product group and oil refining – chemical integration product group, adapting to Shenyang’s overall plan. Shenyang Chemical Industry Park will be constructed in two periods, i.e., near-range and long-range as planned. The near-range planning area covers an area of 12.8km2 in the east, starting from the planned road
in the east (west of the low-lying water surface in the south of Shaling) and extending to Lintai village in the west. It borders on the planned development avenue (1100m to the south of Beijing-Shenyang expressway) and Sanmangniu village, to Tiexi district boundary and 1200m to the north of ShenPan highway in the south. Relying mainly on the rubber industry park, coal chemical project, fuel oil project, new chemical materials and special chemicals, public works and auxiliary facilities such as thermal power station and sewage treatment plant will be built. The area of 4 km² in the east end of Chemical Industry Park is the start-up area and this project is in the northeast part of the start-up area.

The long-range planning area is the area of 17.2km² in the west, which is primarily based on logistics center, oil refining project and ethylene integration project with part of land reserved. Public works and auxiliary facilities including thermal power plant and sewage treatment plant will be built.

The two periods cover a land of 30.0km² and their four borders are as follows: starting from the planned road (west of the low-lying water surface in the south of Shaling) and extending to Xiaogaohuabao(Urban Gas Company Foundery) in the west, to Panwu highway in the southwest corner, to the planned development avenue (1000--1700m to the south of Beijing-Shenyang expressway) and Ermangniu village and Damangniu village in the north and to Tiexi district boundary and 850--1200m to the north of ShenPan highway in the south.
Figure 3-3-1 plan map for Shenyang chemical park
Figure 3-3-2 plan map for Shenyang industrial corridor

- Manufacture key area
- Construction material industrial area
- Metallurgy industrial area
- Shenyang chemical area
- Industrial corridor in west of Shenyang
3.3.3 Plan for infrastructure facilities and workable situation

3.3.3.1 Water supply

Water for each enterprise in the Chemical Park is supplied by the Park in a unified way. Water is supplied jointly by Langjia Water Source and Zhajia Water Affairs Company, East-to-West Water Diversion project (Phase I) and intermediate water recycle project. The start-up area is supplied by Zhajia Water Affairs Company and Langjia Water Source.

One water works will be built in the Park for secondary pressurization and water distribution in addition to providing each enterprise in the Park with industrial and domestic water.

3.3.3.2 Drainage

① Drainage network: The drainage system in the Park adopts the separation system of rainwater and sewage. The industrial sewage from each industrial equipment area, auxiliary production equipment area and public facilities, domestic sewage after treatment in the septic tank as well as initial rainwater in the pollution area are discharged into the sewage drainage system while rainwater is discharged into the rainwater drainage system. The sewage and rainwater from the Park will be finally discharged into the Xihe River after treatment.

② Sewage treatment plant

Two sewage treatment plants will be built in the Chemical Industry Park as planned. The industrial and domestic sewage from large enterprises or enterprises with large water discharge and initial rainwater in the polluted area are collected by the sewage network of each industrial enterprise for pretreatment and will be directed to the sewage treatment plant for centralized treatment after meeting the inflow standard of the plant. After meeting the standard for Grade II set in the Emission Standard for Pollutants in Urban Sewage Treatment Plants (GB18918-2002) through treatment, it will be piped into the water recycle system in the Park after in-depth treatment; Part of it will be discharged into Xihe River through the pressure pipe. To ensure discharge of outward sewage up to standard, water quality online monitoring instrument is provided in the sewage treatment plant.

At present the drainage works for the Chemical Industry Park project (Phase I) has been finished and is expected to be put into trial operation by the end of 2009. The service scope of the sewage treatment plant covers industrial and domestic sewage from resident enterprises of
12.8km² for Phase I with a handling capacity of $1.0 \times 10^4 m^3/d$. The plant adopts the contact oxidation process. The sewage from this project will be directed to the sewage treatment plant for unified treatment. A sewage treatment service contract has been concluded with the plant as attached below.

3.3.3.3 Heating plan

The Shenyang chemical industry park plan is divided into two phases of construction. The Datang International Power Generation Co., Ltd. in the Shenyang chemical industry park, The first phase of the project environmental impact report in Apr. 2009 was entrusted to National Center for Environmental Assessment for organizational review by the Ministry of Environmental Protection of China, at present is being examined and approved. Its construction scale for 2×400MW, located at 1.4km west side of this project. The temporary heating source plant in the chemical industry park of first phase of construction has completed and put into operation in 2007, can satisfy the hot-using demand in this region enterprises which have moved into. The first phase of construction scale is 2 sets of 25t/h steam boiler, for the steam parameter is 2.5MPa, 300 the superheated steam.

The peak steam demand for the process in this project is 36t/h and 2.25MPa and peak heating steam demand totals 80t/h and 0.6MPa. Total steam consumption in the heating period comes to 116t/h and as the steam supplied for project by the temporary power plant of Chemical Industry Park fails to meet the requirement for this project, Shenxi Thermal Power Plant is to supply 2.25MPa steam. With a pressure release valve fitted in the factory, part of steam will be depressurized for heating.

3.3.3.4 Transportation plan

In the Chemical Industry Park a special railway line will be built in line with the plan for construction of a special railway line for Shenxi Industry Corridor. The Line will be linked on the west side of Shaling Station in the western corridor, extend westward in parallel with the railway line there to the planned Xihe Shisan street and then turn to the south and the east on the north bank of Hunhe-Puhe River Irrigation Channel after crossing Shenxi Development Avenue, where a yard for the Chemical Industry Park is to be set up go through Chemical Industry Park stride over Hunhe-Puhe River Irrigation Channel, reach Jiubeijie street which has a parallel with Xihe, turn eastward after reaching the Casting & Forging Industrial Park, where a yard for the Casting & Forging Industrial Park is to be set up and finally lead to the coking gas plant. At present Shenxi Industrial Corridor and special railway line for the...
High Performance Radial Tires Environmental Protection Relocation, Renovation and Extension Project

Chemical Industry Park are under construction.

On the north side of the Chemical Industry Park a development avenue will be built; Xincai highway will be reconstructed and ShenPan highway will be expanded; road network will be built in the Park. Now the highway network is basically built up.

3.3.4 Terms and conditions for presence of industrial projects in the park

The general guiding principle is to prohibit those investment projects that endanger production safety with serious environmental pollution, nonconformity of product quality with the national standard, high raw materials and energy consumption or those banned by the state laws and regulations, from entering the Park; to restrict those with overproduction capacity, no improvement in the product mix, backward process technology (replaced by advanced and sophisticated process technology), that are not conducive to resources conservation and protection of ecological environment or those restricted by the state laws and regulations to the Park.

3.3.5 Conclusions on environmental evaluation and examination-and-approval condition of Chemical Industry Park

To achieve sound development of Chemical Industry Park, in 2006 Shenyang Chemical Industry Park entrusted Shenyang Research Institute of Environmental Sciences with the task of formulating EIS for the Overall Plan for Shenyang Chemical Industry Park, which was examined by Shenyang Bureau of EP with examination comments made in the Document of S.H.B.S. Zi (2006) No.218. The plan was adopted after deliberation at the third director session of Shenyang Urban and Rural Planning Committee in 2006 and the Overall Plan for Shenyang Chemical Industry Park was approved by Shenyang Municipal Government in principle and relevant contents of the Plan have been included in the revision and compilation of the new round urban overall plan for Shenyang (Refer to the Attachments for details).

Conclusions on the examination of environmental evaluation of Chemical Industry Park

(1) The project with environmental risk in industrial zone should implement risk prevention measurement and emergency preplan strictly, the width of sanitary protection zone of 1.5 km must be in accordance with the “Report”, and the residential district inside should carry out relocation measurements.

(2) Industral zone should adopt central sewage treatment measurements and reduce the waste water discharge by utilizing intermediate water reusing method to increase the utilization rate of regional water resources from the angle of clean production.

(3) Industral zone should carry out central heating and promote clean energy to effectively control and reduce the discharge of district smoke (dust) and SO₂.

(4) The land in industrial zone is polluted by cadmium, thus the comprehensive
improvement should begin with the entry projects, the top soil that is seriously polluted should meet the requirements of national hazardous wastes regulations and mustn’t be discharged at random. Green the bare land to cover soil replacement so as to prevent the secondary pollution caused by dust emission from heavy metal contaminated soil.

3.4 Investigation of emissions from the enterprises within the evaluation scope

At present 44 projects in Shenyang Chemical Industry Park have passed the EP examination and 8 projects are under examination. Five projects have been put into trial operation and the rest are all under construction. For main pollution sources and pollutants discharged from the Park, refer to Table 3-4-1.

<table>
<thead>
<tr>
<th>Name of enterprises</th>
<th>Main products and scale</th>
<th>Main pollution elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shenyang Dongrui Fine Chemicals Co. Ltd</td>
<td>2000t/a Cyanodiester, 100t/a Sublactam Sodium</td>
<td>Ethanol, bromine, COD</td>
</tr>
<tr>
<td>Shenyang Chenghe Chemicals Co. Ltd</td>
<td>15000t/a Aromatic hydrocarbon 15000t/a</td>
<td>Benzene, toluene and xylene</td>
</tr>
<tr>
<td>Shenyang Heping Radial Tires Manufacturing Co. Ltd</td>
<td>2.4m/a All steel wire radial tires and 6 m/a semi-steel wire radial tires</td>
<td>Dust, H₂S, CS₂, NMHC, COD</td>
</tr>
<tr>
<td>Shenyang Sanxiang Tires Co. Ltd</td>
<td>All-steel wire radial tires, hose and belt</td>
<td>Dust, H₂S, CS₂, NMHC, COD</td>
</tr>
<tr>
<td>Temporary power plant for the Park</td>
<td>Two 25t/h steam boilers</td>
<td>SO₂, Smoke</td>
</tr>
</tbody>
</table>

For predicted emission of major pollutants from neighboring enterprises similar to those in this project, refer to Table 3-4-2.

<table>
<thead>
<tr>
<th>Major pollutants</th>
<th>COD</th>
<th>Benzen e</th>
<th>Toluene</th>
<th>Xylene</th>
<th>Ethanol</th>
<th>Methanol</th>
<th>SO₂</th>
<th>Smoke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise s in trial operation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanxiang Tires</td>
<td>20.50</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Heping Radial Tires</td>
<td>35.06</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Chenghe Chemical</td>
<td>0.25</td>
<td>34.13</td>
<td>7.0</td>
<td>0.57</td>
<td>—</td>
<td>—</td>
<td>10.0</td>
<td>0.24</td>
</tr>
<tr>
<td>Dongrui Chemical</td>
<td>73.54</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>3.8</td>
<td>—</td>
</tr>
<tr>
<td>Temporary Power Plant</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>390</td>
<td>229</td>
</tr>
<tr>
<td>Tianfeng</td>
<td>0.41</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0.49</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
### 3.5 Plan for Relocation of Residents in Shenyang Chemical Industry Park

According to the plan for Shenyang Chemical Industry Park, the existing residential area in the planned zone is to be relocated without exception. Now the land acquisition work for the land used for Phase I project has been finished and the residential area will be rebuilt in other villages and in combination with small town construction, a satellite city will be built at the places where the governments of Dapan, Gaohua and Sifangtai towns are to be located. Relocation of residents will begin from 2009 to April 2011 and immigrants will be placed successively in light of the land-use requirements of Chemical Industry Park. As a result no residential area will exist nearby after completion of the project.

### 3.6 Major Environmental Issues in the Area and Restricting Factors

1. The status quo of water quality in Xihe River (as the receptor of the rain water and treated sewage in the Park) is worse than the national standard for Grade V. So intensified efforts must be made in improving the Xihe River valley for greater environmental capacity.

2. The Chemical Industry Park enjoys a low-lying and flat terrain with developed surface water system and abundant groundwater resources. The ground surface is composed of Hunhe River alluvial flat deposits with greater seepage and lower buried depth of groundwater. As this area is vulnerable to pollution, the resident enterprises should stress anti-seepage treatment and enhance environmental management.

3. The urban district of Shenyang is a SO₂ control zone divided by the State. Through comprehensive prevention and control SO₂ concentration in 2000 met the urban air quality standard for Grade II and urban air quality has improved noticeably.

4. The land acquisition work within the scope of land used for Phase I project of Chemical Industry Park has been finished and relocation of residents is just under way.
Whether the residents can be relocated promptly and placed properly will become a restricting factor to the construction of the Chemical Industry Park.

4. Analysis of Environmental Impact in the Construction Period and Pollution Prevention Measures

The project construction includes two parts: building new factory and shops, installing equipments, the used equipments in old factory demolition and relocation and demolition of buildings.

4.1 Analysis of environmental impact and pollution prevention measures during the construction of the new factory

4.1.1 Analysis of atmospheric impact and pollution prevention measures

(1) Air Impact Analysis

Air pollution mainly comes from the dust and the waste gas produced during all the construction phases, the main pollution factor is dust, during the construction period many links can produce the dust, including the following:

· During the location ground construction, dust is caused from earth and sand transporting, loading, unloading, stacking and scene transporting process; in the case of the construction materials stacking dust is caused in the windy time.
· The dust from cleaning up and the stacking construction garbage;
· The dust caused by vehicles and workers on construction site road.

The dust quantity of construction and its impact scope has a lot of factors, including the size of the wind on the operation site, the humidity of materials, operating workers’ civilization degree etc., dust quantity and its impact scope is more difficult quantitative, so to have an analogy analysis by using the measured data of construction site.

Beijing Institute of science and environmental protection has ever tested the dust of 7 architecture engineering construction sites, the wind speed tested was 2.4 m/s, the test results see table 4-1-1.

<table>
<thead>
<tr>
<th>Distance(m)</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>100</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration (mg/m³)</td>
<td>1.75</td>
<td>1.30</td>
<td>0.780</td>
<td>0.365</td>
<td>0.345</td>
<td>0.330</td>
<td>0.29</td>
</tr>
</tbody>
</table>

Test results show that dust impact scope is about 200m, to the dust leeward 0~50m is the heaviest pollution zone, to 50~100m is heavier pollution zone, to 100~200m is the light
pollution zone, outside 200m is very small impact to the atmospheric environment.

Around this project the nearest protected object is Wenjiawazi village in northwest direction, the village land-levying has ended, the resident not yet all moves at present. Wenjiawazi village is above 300m to the nearest the construction boundary, and the frequency of this wind direction is little in the site, the construction dust has little impact to ambient air quality in Wenjiawazi village.

Construction dust impact is short-term, after the end of construction, the ambient air quality basic may restore to the present situation level

(2) Dust control measures during construction period

Setting the standard encircle fences around the construction site.
Compacting and hardening treatment to site pavement.
To fall dust with water spraying on earthwork construction
Covering the casual earth hill in the construction site
Covering the vehicles with tarpaulins if the materials transported easily scattered, to prevent the scattered or raised dust to polluting the environment.

Stopping construction work stirred the dust when the wind power is above 4 levels.

4.1.2 Noise impact analysis and pollution control measures

(1) The noise impact analyzes in construction period

The construction equipment noise mainly comes from the construction equipments using in the construction process. Acoustic source intensity of the equipments using in different phases to see Table 4-1-2. The formula which acoustic source attenuation along with the distance as follow:

\[ L_2 = L_1 - 20 \log_{10} \left( \frac{r_2}{r_1} \right) \]

Where:  \( r_1, r_2 \): The distance to acoustic source, m;
\( L_1, L_2 \): \( r_1, r_2 \) Distance of the sound intensity level, dB;

Prediction reults of construction equipments noise to see Table 4-1-2.

<table>
<thead>
<tr>
<th>Phases</th>
<th>Equipment name</th>
<th>Source intensity</th>
<th>The noise intensity level to the source of different distances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>10m</td>
</tr>
<tr>
<td>Cubic of earth</td>
<td>Excavator</td>
<td>95</td>
<td>75</td>
</tr>
</tbody>
</table>
Table 4-1-3  Limitation of Noise Levels on the Construction Site Boundaries

<table>
<thead>
<tr>
<th>Phases</th>
<th>Main noise source</th>
<th>Limitation of noise levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Day &amp; night</td>
</tr>
<tr>
<td>Cubic of earth &amp; stone</td>
<td>Bulldozer, Excavator, Loader, etc.</td>
<td>75</td>
</tr>
<tr>
<td>Piling</td>
<td>A variety of piling-drivers, etc.</td>
<td>85</td>
</tr>
<tr>
<td>Structure</td>
<td>Concrete mixer, Vibration rod, Electric saw, etc.</td>
<td>70</td>
</tr>
<tr>
<td>Decoration</td>
<td>Crane, Elevator, etc.</td>
<td>65</td>
</tr>
</tbody>
</table>

Table 4-1-2 lists the noise level of attenuation with distance by major single construction equipment, Table 4-1-3 lists the Limitation of noise levels on the construction site boundaries. In the construction phase may have several equipments cross-operating, their radiation acoustic level will superimpose. Usually on the construction site different types of construction equipment are operating at the same time, the noise increases differently according to factors of their type, quantity, relative distribution distance, so it is very difficult to calculate its accurate noise level on the construction site boundaries in each time interval, By analogy, comprehensive noise source levels increases 1 ~ 8 dB than the strongest acoustic level of single construction equipment operating.

According to the distance from the project construction to the boundary line of the construction site, all possibly exceeds standard phenomenon, such as cubic of earth and stone, piling, structural construction and decoration. But because of this project is located in
industrial zone, the boundary of the factory is 300m to the nearest sensitive environmental
target—Wenjiawazi village, so the construction noise has little impact to sensitive
environmental objectives of acoustic environment.

(2) Noise control countermeasures in construction period

In construction period, in order to reduce the noise impact, construction management
must be strengthened, to control operating time, especially should strictly control high noise
equipments working at night. The peculiar circumstance that must be continued operation,
should hand in the written application to the local environmental protection department for
approval before construction.

Piling should use the low-noise construction methods of hydraulic drilling, casting
pile-head, to fundamentally reduce the impact of noise pollution.

When formulating the construction plan, avoid the massive high noise equipments using
at the same time as far as possible, avoid arrangement massive power generator equipments at
the same place in order to avoid local sound level too high.

Because of greater impact on the environment for night transport, so transport
should be avoided at night, the vehicles should be regular maintenance, to reduce or eliminate
a whistle, reasonable arrangements for transport routes.

4.1.3 Impact analysis and countermeasures for sewage discharge in construction period

In the construction period, waste water mainly comes from constructors' sanitary sewage
and the few oil sewage which produces in the construction machinery service.

In the construction period sewage pollutant is mainly COD, BOD₅, NH₃-N, the oil and
SS etc.

When construction sets the temporary toilets and the septic tanks in the location, after the
waste water collection, it is delivered through the Chemical Industrial zone draining water
pipe network then to be treated in the Park sewage treatment plant.

4.1.4 Disposal measures of solid waste in construction period

(1) Living garbage should be designated collection, entrust the local environmental
sanitation department to clean up and take away promptly.

(2) Sent the construction waste to designated discharge point by the urban construction
department to discharge.

4.1.5 Analysis of ecological impacts and effects of soil erosion

New plant construction site sign to be constructed for industrial land, the location already
leveled, so it has little ecological impact which construction produces. It is smoother in this
project land scope, the paths, the pipe network all around have completed, sets the standard
encircle fences around the site boundary, so it will not bring the massive soil erosion. Hunhe-Puhe River Irrigation Channel on the south side of the factory watering only in the field irrigation season, and it is parted by Shenchengxi 5 east road, treelawn and dike between the factory boundary and the irrigation ditch, so the sewage cannot enter into the Hunhe - Puhe River Irrigation Channel. In order to reduce the water and soil erosion, should take the following measures:

1. Earthworks construction should be prohibited when heavy rain and storms.
2. The provisional stack field should be covered.
3. In the construction area the path and ground of constructors temporary living area should be hardened
4. The cubic of earth and stone excavation works arrangement should avoid the rainy season as far as possible.

The soil in the plant site is polluted by cadmium. During the construction process, the surface soil is not allowed to discharge freely and the volumes of excavation and filling should be balanced in the plant area and it should minimize the surface soil disturbance to reduce arising dust from it.

4.2 Environmental Supervision in Construction Period

Construction Project Environmental Supervision means that in the process of project construction, entrusted by the project unit, the supervision unit with the Environmental Protection supervision qualification, should make the whole process of supervision for implementation of the "three at the same time "measures of environmental pollution prevention and control of supporting the construction for the project, make the inspection to the environmental impact of construction units’ building activities, and inspection pollution control measures and ecological protection situation and the technical supervision process, to ensure that the environmental protection measures have solid implementation to meet the requirements in environmental impact assessment documents and approved, in line with the completion of the environmental protection conditions of acceptance.

The original State Environmental Protection Administration carried out experimental work of construction project environmental protection supervision. In April 2007 Liaoning Province has released Liaoning Provincial Construction Project Environmental Supervision Interim Management Measures, the management measures requires the construction of new projects awarded to the implementation of environmental supervision, in order to protect the "three at the same time" system implemented.
During construction period environmental supervision should be in accordance with the laws and administrative regulations and related technical standards, design documents and project contracts, supervise on behalf of the construction unit to the contractors’ environmental protection measures, pollution control facilities of the production operation, construction quality, construction time limit, the use of funds and so on.

This project supervision work as follows:

1. Supervision of sewage collection and treatment measures during construction period.
2. Supervision of solid waste disposal during construction period.
3. Carry out the supervision the treatment and disposal program and orientation for contaminated soil during construction period to prevent the pollution transfer.
4. Supervision for Inhibition of dust pollution prevention measures.
5. Supervision to the measures of greening and ecological protections during construction and after completion.
6. Supervision to the measures of pollution prevention in demotion of old shop, the schemes of hazardous waste disposal, groundwater and soil restoration.
7. Supervision to the other measures reported in the environmental impact statement.

To ensure the effective implementation of the requirements proposed in the approved environmental impact report that ensures the quality and progress of environmental pollution treatment facilities and environmental risk prevention facilities.

There is a construction content only in first term of the construction. For the second term and the third term, it is only increase the corresponding equipments and their matching precipitators, so we will carry out the supervision for implementation of the precipitators.

5. The Control Analysis of Total Pollutant Emission quota

Based on “the technical guidelines for environmental impact assessment”, “the temporary provisions for controlling total sewage volume of construction project environmental management in Liaoning province”, “the control planning for total pollutant emission quota during ‘Eleventh Five-Year Plan’ in Shenyang” and other relevant national, provincial and city requirements, by analyzing the status of the project major pollutants and approving total permit emissions, combined with the principle of total control quota of pollutants of the project in Shenyang area, the report analyzes and determines the project control schedule of wastewater, waste gas pollutant emission and provides the basis for the supervision and
management of the environmental protection departments.

5.1 Total quota control factor

According to the planning requirements of national, Liaoning province, Shenyang City for total control quota of pollutants in "Eleventh Five-Year Plan" and for the pollutants of the project, we determine the control factor of this project for the total quota of COD, SO₂, dust, solid wastes.

5.2 Total emissions accounting

For the volume of the occurred pollutants, the treatment reduction and the emissions in the project, see Table 5-2-1.

<table>
<thead>
<tr>
<th>Major pollutants and emissions</th>
<th>Emission total</th>
<th>Can be reduced</th>
<th>Forecasted emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>COD</td>
<td>74.703</td>
<td>24.342</td>
<td>50.361</td>
</tr>
<tr>
<td>Ammonia nitrogen</td>
<td>5.0</td>
<td>1.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Soot</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SO₂</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Industrial dust</td>
<td>3059.6</td>
<td>3029.004</td>
<td>30.596</td>
</tr>
<tr>
<td>NMHC</td>
<td>17.758</td>
<td>0.147</td>
<td>17.611</td>
</tr>
<tr>
<td>Industrial solid waste</td>
<td>5428.4</td>
<td>4921.9</td>
<td>506.5</td>
</tr>
</tbody>
</table>

5.3 The pollutant discharge declaration volume

According to the pollutant features, the feasibility and reliability of pollution prevention and control measures of the project, it is proposed to declare the emissions as Table 10-3-1.

<table>
<thead>
<tr>
<th>Sort</th>
<th>Item</th>
<th>Discharge declaration volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste gas</td>
<td>Dust</td>
<td>30.596</td>
</tr>
<tr>
<td>Wastewater</td>
<td>The taking over volume of the sewage treatment plant in Chemical Industry Park</td>
<td>Emissions</td>
</tr>
<tr>
<td>COD</td>
<td>50.361</td>
<td>17.47</td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
<td>-------</td>
</tr>
</tbody>
</table>

High Performance Radial Tires Environmental Protection Relocation, Renovation and Extension Project
5.4 Comparison with international standards

In the table 5.4.1 is a comparison of main emissions with international standards for Rubber industry (International Finance Corporation Environmental, Health, and Safety Guidelines METAL, PLASTIC, AND RUBBER PRODUCTS MANUFACTURING).

Table 5.4.1 Michelin shenyang SHY2 project environmental emissions comparison

<table>
<thead>
<tr>
<th>Type</th>
<th>Location</th>
<th>Cat.</th>
<th>Unit</th>
<th>Michelin Group</th>
<th>International standard</th>
<th>Chinese local requirement</th>
<th>Anticipated emission of the project</th>
<th>Compliance with international standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas emission</td>
<td>outlet of dust collectors</td>
<td>dust</td>
<td>mg/m3</td>
<td>if risk of fire requesting the use of a cyclone (for example retread activity); not higher than 20 mg/Nm3; If no risk of fire £ not higher than 5 mg/Nm3</td>
<td>30-40</td>
<td>Carbon black:18; others:120</td>
<td>9-15mg/m3 with fire risk</td>
<td>YES</td>
</tr>
<tr>
<td>Gas emission</td>
<td>all</td>
<td>VOC</td>
<td>mg/m3</td>
<td>NA. The Michelin Group measure is in kg of VOC / Ton of tyre produced (see Table 10.4.2)</td>
<td>20</td>
<td>NA</td>
<td>see Table 10.4.2</td>
<td>NA</td>
</tr>
<tr>
<td>Water discharge</td>
<td>whole plant</td>
<td>PH</td>
<td>NA</td>
<td>6--9</td>
<td>6--9</td>
<td>6--9</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>Water discharge</td>
<td>whole plant</td>
<td>COD</td>
<td>mg/m3</td>
<td>Direct discharge to surface-waters meet the following requirements: a) have the following concentrations: - TSS × if flow £ 33 pound/24 hour (15 kg/day) then TSS &lt; 100 mg/l × if flow &gt; 33 pound/24 hour (15 kg/day) then TSS &lt; 35 mg/l</td>
<td>250</td>
<td>300</td>
<td>100</td>
<td>YES</td>
</tr>
<tr>
<td>Water discharge</td>
<td>whole plant</td>
<td>TSS</td>
<td>mg/m3</td>
<td>Direct discharge to surface-waters meet the following requirements: a) have the following concentrations: - COD × if flow £ 220 pound/24 hour (100 kg/day) then COD &lt; 300 mg/l × if flow &gt; 220 pound/24 hour (100 kg/day) then COD &lt; 125 mg/l</td>
<td>50</td>
<td>300</td>
<td>100</td>
<td>YES</td>
</tr>
<tr>
<td>Noise</td>
<td>whole plant</td>
<td>noise</td>
<td>dBA</td>
<td>NA</td>
<td>70</td>
<td>65,day;55,night</td>
<td>not higher than 55</td>
<td>YES</td>
</tr>
</tbody>
</table>
In the table 5.4.2 is the actual achievement of Michelin Group about main environmental impacts measured throughout the entire group and published in the sustainable annual report of 2009, as Michelin act as a global group and want to reduce its environmental footprint at a global level.

**Table 5.4.2 Performance of the MEF(1) and its components 2005-2009**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy consumption</td>
<td>17.4</td>
<td>15.3</td>
<td>16.1</td>
<td>-7.5%</td>
</tr>
<tr>
<td>Water consumption</td>
<td>15.0</td>
<td>12.8</td>
<td>13.3</td>
<td>-11.3%</td>
</tr>
<tr>
<td>VOC* emissions</td>
<td>4.27</td>
<td>3.13</td>
<td>3.04</td>
<td>-28.8%</td>
</tr>
<tr>
<td>CO2 emissions</td>
<td>1.53</td>
<td>1.35</td>
<td>1.43</td>
<td>-6.5%</td>
</tr>
<tr>
<td>Waste produced</td>
<td>140</td>
<td>127.5</td>
<td>121.2</td>
<td>-13.5%</td>
</tr>
<tr>
<td>Waste landfilled</td>
<td>33</td>
<td>16.2</td>
<td>13.3</td>
<td>-59.7%</td>
</tr>
<tr>
<td>MEF</td>
<td>100</td>
<td>78.6</td>
<td>78.1</td>
<td>-21.9%</td>
</tr>
</tbody>
</table>

(1) Michelin sites Environmental Footprint. Each component counts for 15% of the total except for VOC emissions, whose priority status means that they count for 25%. Calculation of these indicators and their data are reviewed by PricewaterhouseCoopers.

* PP = tonne of tires produced.

6. Analysis of Cleaner Production

During about 100 years of continuous innovation, Michelin Company forms the Five “Respects” enterprise core values, “Respect Environment” included. The environment protection concept, idea, measure and behavior run through factory site selection, design and building of factory, selection and purchase of equipment, perfect environment protection system, design and production for products and wastes recycling etc. In order to achieve the sustainable development of transportation industry in the world, in 2005, Michelin Company establishes the “Michelin Environmental Footmark” for global factories and sets its major environment protection improvement target of 2011 and has also made considerable gains (see the following picture).
Water recourse  Goal-10%
Save water resource. Make use of closed cooling system to prevent leakage and strengthen the sense of responsibility of all staff is a relevant way of saving water.

Volatile organic double compound  Goal-25%
Michelin Company chooses to reduce the emission of volatile organic double compound rather than dispose the solvent that has been emitted. New procedure and viscous product consume small amounts of solvent.

CO₂  Goal-10%
Decrease the group emission of CO₂ means reduce the energy consumption, develop the renewable energy sources, such as bioenergy, solar energy and wind energy.

Energy  Goal-7%
The power consumption occupies 60% of group energy consumption, the coal-fired consumption occupies remain 40%, the energy consumption procedure optimization and waste control are the two important opportunities about power consumption reduction.

Landfill  Goal-60%
The selective classification is the key to cycle, currently, recycle the wastes from factory at 100% is possible on technology.

Wastes  Goal-5%
Reduce the wastes, including raw material and other materials’ consumption.

Michelin Shenyang Tire Co., Ltd. (Michelin · Shenyang) is a wholly-owned subsidiaries of Michelin Group, an integral part of Michelin Group scope, and has gotten supports from Michelin Group on technology, technique, management, allocation and train of human recourses etc., Michelin environment management system will be implemented in
Michelin · Shenyang all sidely, thereby ensure the products from Shenyang and the products from Euramerican factories have the same quality level and technology content.

6.1 Analysis of the Fundamental Principles of Cleaner Production

According to the Article 18 in “Cleaner Production Promotion Law”: “New construction, construction renovation and expansion projects shall conduct environmental impact assessments with respect to analysis and assessment of use of law materials, resource consumption, comprehensive utilization of resources, as well as generation of pollutants and their treatment, shall accord priority to adopting cleaner production technologies, processes and equipment, which maximize the resource utilization rate and generate few pollutants.”

This evaluation from the items of basic construction raw material use, the technique of production and equipment aspects and so on sophistication, product performance, resources and energy comprehensive utilization, pollutant control carries on the analysis to this project's cleaner production level. Refers to "the Tire Profession Cleaner Production Evaluating indicator System (Implementation) the Target", this evaluation choices synthesis energy consumption, the unit product electricity consumes, the unit product steam consumption, the rubber consumption, the fresh water consumption, the product characteristic, the pollutant discharge amount, the solid waste synthesis use rate and the environmental management system takes this project cleaner production level the evaluating indicator.

6.2 Cleaner Production Analysis of Raw Materials and Energy Consumption

6.2.1 Raw materials and energy choices

(1) Choose environment friendly technical oil

By 2011 aromatic hydrocarbon oil in passenger vehicle tire production will fully stop using, and by 2013 aromatic hydrocarbon oil in truck and bus tire production will fully stop using, then environmental protection aromatic hydrocarbon oil TDAE and MES will be used instead, these two substitutes are low-toxicity, low-irritant.

(2) The enclosed and dedusting raw material using process reduces the emission.

The carbon black, the fuel oils, and each kind of supplementary material uses the airtight pipeline to transport, the automatic weighing and the batch feeding, to install the dust remover on producing the dust spot in each batch feeding for reducing the dust emission.
(3) Reducing or canceling the use of volatile organic substance reduces the VOC emission.
In order to reduce VOC emissions in the mixing process, Michelin Company is having a series of studies to reduce the use of related chemicals, to avoid the use of gasoline in the tire formation process.

(4) Increases the amount use of natural gum without reprocessing to reduce the amount use of the plasticization rubber, thus reduced amount use of dispersing agent and stabilizer.

(5) Heat supply (steam) is energy-efficient and environment-friendly.

The used production steam for the project from the heat source plant in Western Shenyang, back-up boiler uses natural gas as its fuel, natural gas is clean energy. Therefore, this project choice's steam provides way and back-up steam boiler fuel types in line with national energy-saving emission-reducing and clean production requirements.

(6) The curing process is energy-saving.

This project shorts the vulcanization curing time through optimizing production formula, the vulcanization use ratio of car tyre is 20% (traditional technology is 4%), save lots of energy.

6.2.2 Contrastive analysis for raw materials and energy consumption indicators

Based on the target in "the Tire industry Cleaner Production Evaluating Indicator System (Implementation)" (the People's Republic of China State Development and Reform Commission Announces ((2007 No. 24), choices domestic advanced target data, simultaneously also gives the data before and after the removing, compared to the results, to see Table 6-2-1.

| Table 6-2-1 Target Contrast of Raw Materials and Energy Use for This Project |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|
| Index                       | Unit            | The project     | Existing level of project | North America Tire Factory | Domestic advanced level |
| Overall energy consumption  | t/t (Tons of standard coal / ton of processed Rubber) | 1.29 | 1.51 | -- | Full-steel 1.5/ Half-steel 1.4 |
|                            | t/t (Tons of standard coal / ton of tyre) | 0.59 | 0.65 | 0.73 |                             |
| Fresh water                 | m³/t(ton of processed rubber) | 2.7 | 9.62 | -- | 26 |
| Rubber consumption          | t/t (Tons of rubber/ ton of tyre) | 0.53 | 0.43 | -- | 0.55/0.45 |
| Steam consumption           | t/tons of tyre | 1.97 | 2.44 | -- |                             |
By comparison of the results of Table 6-2-1, it can seen that the material and water consumption of the project is better than the average domestic advanced level, and both have larger improvement than Michelin Shenyang Tire Co., Ltd. existing projects. Therefore, the material and energy consumption of the project are up to the advanced level of international cleaner production.

6.3 Cleaner Production Analysis of Raw Materials and Energy Consumption

The project used the Michelin Company’s proprietary technology that is the world's top advanced technology tire manufacturers, the advance of process technology and equipment used mainly show in the following aspects:

(1) Mixing center and advanced technology of Vulcanization process and equipments.

Banbury mixer using high-speed rotor to reduce energy consumption, improve production efficiency. Carbon black used tube closure Pneumatic Conveying System; other chemicals application completely automatic equipment loads separately in the seal bag, the entire ingredient process has realized the intelligent control, reduced the dust production. The site operators and the control room personnel synchronization saw the production process the dynamic monitoring chart, the technique of production, matches stock weigher's actual weighing and internal mixer's real-time mixed iron-smelting data, the real-time curve, the alarm message respectively and so on, thus carries on the operation accurate, raises the production efficiency, reduces the waste rate.

Milling and Vulcanization processes of tire production process has the Max. energy-saving potential, the process shortened the time of mixing and the vulcanization, adding the various processing aids at formula can be effectively shortening the rubber mixing cycle. In addition, on the use of advanced auxiliary systems and automatic control means to reduce mixing equipment idle operating time to achieve the purpose of energy saving. Speaking of the curing, this project, besides reduces the vulcanizing time through the optimization production formula, but also uses the tire curing temperature measurement to adjust and reduce vulcanizing time.

Some domestic enterprises in the car radial tire vulcanization generally used as the

<table>
<thead>
<tr>
<th>Power consumption</th>
<th>kwh /tons of tyre</th>
<th>954</th>
<th>1278</th>
<th>--</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water circulation utilization</td>
<td>%</td>
<td>99</td>
<td>96</td>
<td>--</td>
</tr>
</tbody>
</table>
internal pressure of the steam heating medium. The project used nitrogen / steam curing systems. This has been new vulcanizing process occurred abroad for nearly three decades, the steam as hot carrier, nitrogen sulfide body to ensure that the necessary pressure, and steam / hot water curing process of comparison, the sulfide to reduce energy costs 50% to 80%, curing cycles may be shortened by more than 10%, and effectively improve the passing rate of Products. In addition the curing capsule's life may lengthen 25%~100%.

(2) Tire production shop

- The use of high-precision rolling machines, extrusion lines will use such equipments as two composite compound, three composite compound and four composite compound. Most of Rolling and extrusion machines are the cold feed equipment imported from foreign country.
- The use of solvent-free coating of a high-precision molding technology, imported high-precision, high efficiency and high degree of automation of advanced equipment.
- Using hydraulic vulcanizer to use mixed gas (steam + nitrogen) curing technology, automatic control of curing process, optimizing the curing time.
- Realize the VOC monitoring of each position, and if the VOC emission exceeds of some position exceeds the requirement, measures will be taken to reduce the emission (such as controlling the usage amount of solvent naphtha or controlling the equipment scale. )

6.4 Cleaner Production Analysis of Product

6.4.1 Green tire saves engery and reduces CO$_2$ emission.

The Michelin Company venerates the green environmental protection idea, carries on the product design based on tire's life-cycle analysis result, the tire product life-cycle analysis result indicated that the tire using process is the biggest stage of effect on environment. In the automobile travel process the rolling resistance is material effect factor of the fuel oil consumption and the automobile exhaust emissions. Michelin Company first silicon raw materials used in tire tread, thus the birth of the Michelin green tires. This technological innovation reduces about 30% of tire rolling resistance, more than 4% of fuel saved, equivalent to savings of 3 to 5% of carbon consumption, significantly reduce the CO$_2$ greenhouse gas emissions in the process of using of a tire. For example, Michelin has sold over 500 million green tires, which means:

---save over 9 billion liters fuel oil
---reduce CO$_2$ emission of 2.2 million tons
---save 44 liters fuel oil per minute
---reduce CO$_2$ emission of 109 kg per second

Under the premise of not changing the other properties (such as the use of cycles, braking distance), Michelin’s new generation of green tire Energy Saver still devoted in reduces the rolling resistance. It is evaluated the best tire by the European magazine, and is suitable for the brand-new low oil consumption automobile. Such a kind of green tire will be produced by this project.
CO₂ Emission of Car Tyre
(195/65 R15H Summer tyre)
The effect of automobile on environment is mainly relative to rolling resistance. The rolling resistance is also an important factors to consider on both fuel oil consumption and automobile exhaust emission.
Raw material production: 103 kg emission.
CO₂
Steel industry
Petroleum refining industry
Rubber tree plant
Chemical and textile industry
Produce four pieces of tyres: 20 kg CO₂ emission
During automobile use (500km): discharge 9412 kg CO₂ for each automobile.
Tyre retreading
Materials recycling
Energy recycling

Four pieces of tyres are equivalent to: 1750 kg CO₂, the green tyre may reduce 250 kg CO₂ emission

6.4.2 Noise Reduction Design of Tire

The noise in tire life cycle is another effect factor on environment. Michelin Tire Company in thorough research to dimensions and tread pattern, thorough reasonable size and asymmetrical tread design reduce tire and road surface contact noise.

The tire quality on the project achieves China national standards, the American DOT markings, the European ECE Symbol as well as the software technique internal control indexes, enables the product quality to achieve the international advanced level.

This project mainly produces energy-saving car radial tyre and truck radial tyre, the creative design and processing technique make the products have long use life, saving oil and low noise environment-friendly functions.

6.5 Analysis of Pollutant Discharge Cleaner Production

6.5.1 Pollutant control measures analysis of cleaner production

The main source of atmospheric pollution in production of tires is mixer smoke. This project uses renewable heat VOC vocsidizer (VOCSIDIZER) made by German MEGTEC Corporation, this equipment VOC purification efficiency may reach 99.7%. German MEGTEC Corporation has more than 30 years’ oxidation designs and the production experience, more than 2,500 machines operation, the oxidation technology leading global. The VOCSIDIZER main feature is simple structure, high efficiency, VOC does not have the open fire in oxidation process, therefore without by-products in the conventional combustion. VOCSIDIZER heat efficiency high, can ensure VOC be fully utilized in Oxidation process of heat, and during operation VOCSIDIZER do not consume any energy. Analyzes from the energy conservation aspect, VOCSIDIZER is belongs to advanced energy conservation environmental protection government equipment.

6.5.2 Pollutants discharge index contrastive and analysis

<table>
<thead>
<tr>
<th>Table 6-5-1 Pollutants Discharge Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Waste water</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td><strong>CODcr</strong></td>
</tr>
<tr>
<td><strong>CO₂</strong></td>
</tr>
<tr>
<td><strong>VOC</strong></td>
</tr>
<tr>
<td><strong>solid waste</strong></td>
</tr>
</tbody>
</table>

Note: The pollutant emission of North America Tier Factory can represent the international advanced level, product=product+semi-finished product.

### 6.6 Waste Comprehensive Utilization

This project adopts the advanced technology, equipment and control measures. The upper auxiliary engine carbon black delivery system uses the advanced air-transporting system to reduce the carbon black dust emissions and raise the utilization ratio of carbon black. Due to the use of advanced full automatic processing and control measures, we have achieved the whole process control on production, increased product percent of pass and reduced the solid waste yield, meanwhile we make use of the generated solid waste comprehensively, to achieve the resource utilization of solid waste, its comprehensive utilization ratio up to 74%.

Retreated tires of this project have manifested the waste comprehensive utilization and the circulation economy idea. In view of the fact that the Michelin tire carcass of tire's reliable quality, Using the method of renovating the tire tread to re-use tires, so the tire may use two times. Through tyre retreading, we may reduce raw materials and energy consumption, reduces the solid waste emissions.

The global Michelin’s Factory has established the environmental management system, and had the adoption of ISO14001 authentication. Michelin Shenyang Tire Co., Ltd. had the adoption of ISO14001 authentication in 2006 for environmental management, so it has a good foundation and experience. Michelin Shenyang Tire Co., Ltd’s environmental management principles are: emphasis on pollution prevention, compliance with laws, regulations and other applicable requirements of environmental protection, formulates the annual plan of environmental protection, has appropriate and effective communication with the others. Michelin Shenyang Tire Co., Ltd's environmental management system will be used in this
The Michelin group has formulated comprehensively, system's environment requests which including waste management, energy management, waste water emissions, water used management and risk accident management. These management requests has fully manifested the pollution prevention thought, realizes the pollution control from the source and the entire producing process, reduces the pollutant produced from the source. The Michelin’s requirements of environmental management

(1) High-quality environment protection management team

There is management guiders and one person-in-charge who manages the 18-person team of environment protection management, prevention and inspection. Each person has his own duty and task to do.

(2) Strict comprehensive inspection system

(3) There a 2-4 times verification internal and external the group each year; and within the company there is a monthly verification.

(4) Every one is given the responsibility to control each major environment factors, from the general manager to the operator, each person has his own duty on environment control.

(5) The monthly inspection report contain the conditions of every person.

(6) The monthly inspection report is handed to every person.

Strictly require and reform the unqualified.

(7) Strict detailed requirements

① Waste management requirements

● Classifying all the wastes so that the comprehensive utilization and handles finally;

● Waste collection and storage areas requires clean and orderly and has clear identity;

● The solid wastes which possibly producing scatters, uses the suitable storage method to prevent dust generated;

● The wastes that possibly cause the rain water pollution should be sort disposed, these wastes are (such as the waste oil, the sunlight tube, the pollution packing material, space packets, the medicinal powder bag, the industry used oil, the...
battery, the laboratory reject, the waste solvent and so on);

- When the wastes possibly remove (such as: oily wastes, old machine parts, etc.), calls for carrying on cutting-off and collecting the dropping liquid or a row of fluid in order to avoid soil and groundwater pollution;

- The wastes drenched by rain that possibly contaminated soil, the ground water or the rain water is to be requested storing in the anti-leak-proof place, and collecting leaching solution (rain water), then to be treated.

② Energy management requirements

- Vulcanizer conducted on the heating insulation;

- All other parts of the energy loss (vulcanizer / rack, steam pipe joints, steam hoses, etc.) should have a heating insulation treatment.

- Taking a special consideration of the settings of blow-off-valve and hydrophobic relief in order to minimize the leakage of steam. Design and installation of the valve is taking into account that it can be inspected alone on the respective vulcanizer when the accident occurs.

- The steam supply pipeline has heating insulation;

- The pipes used for recycling condensate of non-gasification in the process should be heating insulation;

- The heating insulation material forbids to use the asbestos material;

- Heating for offices, shops and warehouses should optimize the use of energy. Prohibits the use of steam heating, controlling water recycling temperature accordance with changes in external temperature;

- The illumination uses the high illuminating power source, to the different demand, uses the different rank the illuminating power;

- Optimize the use of compressed air.

- The designed air compressor control system must make the air compressor by the maximum work rate revolution;

- The assigned air pressure isn’t higher than the actual need in the shop;

- Do not use the compressed air to dry and cool product;
➢ In order to make air compressor size not excessive, minimize high flow and low flow sustainable use;

③ Management requirements of air pollutant emissions

➢ At each spot need to monitor the atmospheric emissions designed and installed for sampling and monitoring, to ensure it easy to be close, the designed and arranged monitoring points should be at representative of the place;

➢ Minimize the number of the equipments for emissions of pollutants into the atmosphere;

➢ Using the best demonstrated existing technology, so that minimize volatilization of volatile organic compounds (VOC) from the source. For example, the use of composite extrusion, control the use of rubber latex, solvent nozzle, low-VOC chemical formula;

④ Drainage management requirements

● The rainwater, the sanitary sewage collect separately;

● Formulate wastewater pipeline periodic inspection plan;

● All of the wastewater collection pool is sealed;

⑤ Water using management requirements

● Formulate for use water rationing, monitor for use water, install a flow meter for each executes more than 15% of the total water consumption activities;

● If the use of drinking water or groundwater to cool equipment, not the use of open-cycle cooling system;

Michelin Group formulates the above-mentioned environmental management requirements will also apply to the project environmental management, and has been incorporated into the Michelin Shenyang Tire Co., Ltd. ISO14000 environmental management system. Therefore, the project in environmental management is to meet the requirements of Cleaner Production.

Requests in the new factory's environmental management to achieve the following several aspects:

(1) Implement the report of the pollution control measures and proposals to ensure that
the pollutants reach the national and local emission standards, and the requirements of the total quantity control.

(2) In view of this project, establishes the new environmental management handbook, the program file and the work instruction book.

(3) Related parties environmental management, the behavior of raw material supplier, production cooperator, and services must meet the environmental management requirement.

6.8 Cleaner Production Subsection

The project eliminated aromatic hydrocarbon oil and control other toxic raw materials, superior product performance, using international advanced production technology and equipment, resources, energy use has reached the international advanced level of target, low pollutant emissions, all solid waste disposal or reuse of, with good environmental management system and experience. Therefore, the level of cleaner production of this project is the international advanced level in the same industry.

7. Public Participation

7.1 Public participation in public notice

In order to know public's views and attitudes on the project construction around the project and know the affective scope and extent of the project on social, economic and environment and realize the democratization and the popularization of EIA work, according to "the temporary method for public participation in EIA ", the project has done two notices during EIA work. The notices were published on Liaoning Daily. The first date was March 28th, 2008 and the notice period was 10 days. For the notice in detail, see Table 7-1-1; After EIA report is finished, it is noticed again on the day of 4 May, 2009 (for the notice in detail, see Table 7-1-2) and the notice period is 10 days. There is no public feedback within two notice periods, for the details of notice see Table 7-1-1.

<table>
<thead>
<tr>
<th>Table 7-1-1 The Content in the First Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction for construction project</td>
</tr>
<tr>
<td>With the high speed development of China's automobile market, the market demands for Michelin tires on cars, trucks and buses are increased continually. At the same time, in order to suit Shenyang accelerating urbanization process, Michelin Shenyang Tire Co., Ltd. plans to set up a new factory in Chemical Industrial Park of Shenyang Economic and Technological Development Zone. The new plant will use the latest technology and quality standards of Michelin Group and will also be conducive to environmental protection in Shenyang. The new plant takes up an area of 720,000 square meters. After the stable production, the year tires production capacity of trucks and buses will reach at 1800000 and the year production capacity of retread tires (trucks and buses) will reach at 228,000</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
As the new plant’s production capacity is increased, the production activities of existing plant located at Shenxin Road, Tiexi District, Shenyang will be gradually relocated to the new plant in Chemical Industrial Park of Shenyang Economic and Technological Development Zone.

The EIA work of the project will be commissioned to Shenyang Academy of Environmental Sciences. EIA work procedures is following:
1. Based on the preliminary engineering analysis and the environmental status investigation, determine the evaluation work grade and the evaluation focus;
2. Based on the depth engineering analysis and the environmental status investigation, carry out EIA prediction and evaluation and demonstrate the pollution prevention and control measures;
3. Write EIA report and give an evaluation conclusion.

The main work contents:
1. Engineering analysis, environment state, environmental affect prediction and evaluation, comment on environmental protection measures, control analysis of total emission volume and evaluation conclusion.
2. The notice is to seek the public's opinions, advice, recommendations etc. for scale, location and urban development and environmental sustainability of the project construction. The public views can use letters, telephone, fax, email and other forms to communicate and exchange with the construction unit and evaluation unit.

Construction units: Michelin Shenyang Tire Co., Ltd
Address: Shenxin 15, Tiexi District, Shenyang
Postcode: 110141
Tel: 024-25505000 to 8031
E-mail: xin.xin-h603119@cn.michelin.com

Evaluation Unit: Shenyang Academy of Environmental Sciences
Postcode: 110015
Tel: 024-24520937
E-mail: zhanghao@syhky.com

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**Table 7-1-2 The Public Participation Content in the Second Notice**

<table>
<thead>
<tr>
<th>Project name</th>
<th>A transformation and expansion project of high performance radial tire of Michelin Shenyang Tire Co., Ltd for environmental protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction unit</td>
<td>Michelin Shenyang Tire Co., Ltd</td>
</tr>
<tr>
<td>Introduction for construction project</td>
<td>The expansion and the transformation in different places by Michelin Shenyang Tire Co., Ltd. to produce the high performance radial tires. The tire production capacities of trucks &amp; buses and cars are increased to 1,800,000 / year and 10,000,000 / year from current 800,000 / year and 2,000,000 / year respectively. The new increasing tire renovation capacity (truck &amp; bus tire) is 295,000 / year. The new increasing area is 72ha and total construction area is 586,463 m2. The production is carried out rely on Chemical Industry Park for gas, water, electricity, sewage treatment plants and other infrastructure. The construction and the relocation take a non-stop production way and the construction is carried out in three terms. We plan to relocate from 2013 to 2017. The new plant will realize the stable production in 2018.</td>
</tr>
<tr>
<td>Environmental Impact</td>
<td>The production process of the construction project will result in emissions of volatile organic waste gas, dust, noise, wastewater and industrial solid waste; the construction period will result in the construction dust, noise and solid waste. May pollute atmosphere, water and soil. After air pollution control measures are taken, the prediction, the emission of volatile organic waste gas, dust of the project will meet relative emission standards and the effect on the atmospheric environment surrounding the project will be a little. The use of water resources of the project is Reasonable and the water reuse rate is 99% and wastewater that reach at standard flows into the wastewater treatment plant of Chemical Industry Park. All common industrial solid wastes are utilized and a small amount of hazardous solid waste will be submitted to the qualified units for safe disposal and they will not have a negative affect on the environment.</td>
</tr>
<tr>
<td>Pollution prevention and control measures</td>
<td>After collecting, the generated dust is treated by a bag filter and is a exhaust tube according to the arrangement. After the plastic smelting fume is treated for purification by RTO oxide device, it is discharged. The other volatile organic waste gases are collected and are discharged according to the arrangement. The waste water in the production is recycled to use. After it is treated to reach at the standard, it is discharged into the sewage treatment plant of Chemicals Industry Park. All common solid wastes are utilized synthetically. Set up a temporary storehouse for hazardous solid waste and submit to the qualified units for safe disposal of them. For oil storehouse and temporary storehouse for hazardous solid waste, take anti-seepage measures. The pollution control technical measures is economic and feasible.</td>
</tr>
</tbody>
</table>

EIA conclusion: The project production technology is advanced and is conformed to the principle of clean production.
and recycling economy. The construction scale and the technical equipments are in line with the national industrial policy. The project site is conformed to the overall urban development planning and the development planning of Shenyang Chemical Industry Park. The pollutant emissions may meet the environmental protection requirements. Considering from the environmental protection, the project construction in proposed site is feasible.

<table>
<thead>
<tr>
<th>Obtain information way</th>
<th>Obtain a simplified version of the report from Shenyang Academy of Environmental Sciences. The notice time is 10days.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The public investigation scope and the main issues</td>
<td>The investigation scope is the residents and enterprises around the site. It is carried out by releasing the questionnaires. You can go to the site for investigation or fill in a form or call, send a fax, email etc in the evaluation unit or the construction unit. The time for public opinion is within 10 days since this notice date.</td>
</tr>
</tbody>
</table>
| Contact way | Evaluation company : Room 204, Shenyang Academy of Environmental Sciences  
Address: No. 139 Nanta Street, Dongling District, Shenyang City  
Tel and fax: 024-24520937  
Email: syhky206@126.com  Project Owner : Michelin Shenyang Tire Co., Ltd.  
Address: Shenxin 15, Tiexi District, Shenyang  
Tel: 25505000-8031 Fax: 2536 2768  
Email: xin.xin-h603119@cn.michelin.com |
High Performance Radial Tires Environmental Protection Relocation, Renovation and Extension Project

Picture 7-1-1  Public Notice of Two Projects

第一次公示（2009年3月28日~2009年4月6日）

第二次公示（2009年5月4日~2009年5月14日）
Picture 7-1-1 Public Notice of Two Projects
This project situats at Shenyang Chemical Industry Park. After the residents are moved, there is no residents around the factory to do the questionnaire survey.

7.2 Conclusion of public participation

The project is belonged to rubber product industry and Shenyang Chemical Industry Park planning has included the rubber industry. For there is no feedback of these two survies, it can be deemed that there is not public objection for this project.

8. Environmental Management and Environmental Monitoring

8.1 Environmental Management Organization Establishment, Responsibility and Management Pattern

8.1.1 Organization establishments and responsibility

According to the national related request of enterprise environmental protection management monitoring, and based on the nature, scale and pollution emissions, enterprises should establish the appropriate scale of the environmental management organization.

Should be set up a special department of environmental management, environmental management staff with full-time 4 ~ 5, the main functions are:

① According to the national and local environmental protection, production safety and other laws, regulations, standards and other requirements, formulate corporate environmental management, production safety rules and regulations, and timely modify and improve the business environment management and production safety rules and regulations by tracking of the relevant laws, regulations and legislations, provide to the responsible person of the enterprise-wide environmental management proposals, making the production activity has always been in line with national and local environmental protection requirements.

② Carry out the daily environmental monitoring work, including source of pollution statistics of the project, environmental monitoring plan implementation, pollution outlet standardization improvement and so on.

③ Inspection and supervision of the operation situation of pollution treatment facilities in the factory, ensure the enterprise put in certain special funds for the pollution treatment facility maintenance and update, and ensure the normal operation of pollution treatment facilities.

④ Responsible for handling all types of environment and safety accidents, organization and implementation of accident emergency kind post-processing.
⑤ Responsible for communication and contact with local environmental protection department, report to the local environmental protection department statistics report pollution producing and discharge conditions of the enterprise, and the operation situation of environmental protection facilities, and implement the environmental protection departments of environmental protection and management of this project.

⑥ Responsible for the propaganda of environmental protection knowledge, works out the corresponding training plan to raise all staff environmental consciousness.

8.1.2 Management patterns

Michelin Shenyang Tire Co., Ltd. has the good foundation of environmental management and experience, the established ISO14001 environmental management system operated for three years, the environmental management system's characteristic mainly has two aspects: first, the pollution prevention, namely uses the source governing, the cleaner production or the terminal governing method to reduce the harmful environmental effect, and to raise the benefit and reduce the cost; Second, improves continually, namely improves the overall environment achievements unceasingly according to the environment policy. The ISO14001 environmental management system movement pattern is as follows:

![Environmental Management System Operation Mode](image)

**Figure 8-1-1 Environmental Management System Operation Mode**
The enterprise's environment achievements enhance unceasingly in the environmental management system movement process, its environmental management system itself also has the progressive improvement, enterprise's environmental management level enhances unceasingly.

The good environment achievements are not only the enterprise external image request, but also the safeguard for enterprise own positive cycle. Realizes the good environment achievements, must make enterprise's production activity and an environmental protection into organic whole, the construction enterprise should establish new ISO14001 the environmental management system according to the characteristics of the project, unifies the original system operation experience, to definite 17 essential factor content of the system and the centralized management department, the environmental protection proposals or the plan in this report integrates the entire process of enterprise environment design, the implementation, the movement, the supervision and the management, the new environmental management handbook, the environmental management program file, the work instruction book should be established in view of this project's characteristic. Requests as follows:

Environment policy
The environment policy should be formulated by enterprise's highest superintendents, the environment policy should include the following content: 1. the pledge insisted that improves, the pollution prevention principle continually; the pledge observes national and the local related environment laws and regulations and other requests (a package of standard and policy).

Planning
According to the environmental policy, the laws and regulations request, identify new environmental aspects and the important environmental aspects, formulate environmental management goal, the target, the environmental management plan, and stipulated explicitly to enterprise's each department's in environmental management concrete responsibility, give the safeguard to implements system's manpower, the physical resource, the financial resource.

Implementation
Educate and exam the staff on the environmental protection knowledge, training to the key post's staff, ensure that they are qualified for the jobs, prevent to increase the environmental effect because of their work fault; determine latent accident or the emergency
case, formulate contingency plans, guaranteed when the accident occurs, make the response immediately, the prevent or reduce the environmental effect which possibly follows.

Environmental management personnel must constantly track and collect the new laws, legislation, standards and regulations, and adopt corresponding measures to ensure the pollutants emissions, raw materials used, process equipment in continuous satisfy requirement of laws and regulations.

Puts into practice to the environmental management plan, formulate operating control document to possibly produce the environmental effect at each process link, and request the staff to carry on the operation strictly according to the control document.

Inspection, prevention and correction measures

Inspect the situation of finishing the target goal, of the system day-to-day operation and of concrete environmental achievements, and timely formulate and implement of reform measures when inconsistent with the regulations found.

Management review

Enterprise's highest superintendents organize the system related department to carry on an environmental management appraisal at least every year, mainly appraises the enterprise’s behavior the laws and regulations compliance, finishing the goal target, as well as the suggestion which system needs to improve.

According to the environmental management appraisal's result, may determine the operational practice of the environment policy, determined the fresh goal, target, and make the new system plan, in order to get continually improvement of the enterprise environment behavior.

### 8.2 Environmental Monitoring Plan

As a part of environmental management, environmental monitoring has the unique status and the function, to set up the standard the environmental monitoring manifest is the basic guarantee for environmental management. All environmental monitoring work of Michelin Shenyang Tire Co., Ltd. to be entrusted to qualified Environmental Monitoring Station

1. Pollution source of waste water monitoring

According to the concerned requirements, the factory sewage discharge outlets should be monitored, the concrete monitoring plan to see Table 8-2-1.

**figure 8-2-1 monitoring plan of waste water**
The monitoring items and frequency should be adjusted appropriately according to the actual condition of water quality.

(2) Air pollution source monitoring

In order to regulate the exhaust gas emission monitoring, exhaust tube or chimney shall be required to set up the sampling hole, and there is safe sampling platform, equipped with purification facilities to the exhaust gas emission from production facilities of the project. Sampling mouth located separately at export and import of the purification facilities. From the environmental protection graphics signs which show emissions waste gas should be located in the neighbor of discharge pipe (chimney) on the striking ground.

<table>
<thead>
<tr>
<th>Point</th>
<th>Item</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlet of mixing smoke &amp; oxidation waste gas</td>
<td>Odor, NMHC, Xylene, Carbon bisulfide</td>
<td>1 time/half year</td>
</tr>
<tr>
<td>Organized waste gas Discharge outlet</td>
<td>Dust (carbon black, others)</td>
<td>1 time/half year</td>
</tr>
<tr>
<td>No organization boundary emission monitoring</td>
<td>Odor, NMHC, Xylene, Styrene, Carbon bisulfide PM10</td>
<td>1 time/half year</td>
</tr>
</tbody>
</table>

(3) Noise monitoring

Once every six months for monitoring of noise at boundary of the factory.

<table>
<thead>
<tr>
<th>Source of pollution</th>
<th>Item</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise at boundary of factory</td>
<td>Leq</td>
<td>8.3 Environmental Supervision</td>
</tr>
</tbody>
</table>

According to the Liaoning Provincial Environmental Protection Bureau, "Construction Project in Liaoning Province Environmental Monitoring Interim Measures" the project unit should have environmental supervision to the project, the project unit can be commissioned to
the qualified environmental supervision organizations to do the work of environmental supervision. According to the environmental impact assessment document and the Environmental Protection Administration department approved, clearly know the content of environment supervision and sign environmental supervision contract.

8.3.1 The scope and rand requirements of environmental supervision

**The scope of supervision**

① The main engineering construction projects, auxiliary projects, utilities, during the implementation of the environmental protection measures;

② The implementation of pollution prevention measures

③ Environmental protection based on the projects operation of construction works;

④ After change design, the question and the corresponding request raised to the original environmental protection facility's serviceability;

⑤ The other supervision work (soil and water conservation supervision) for construction projects within the category of environmental protection.

**The requirement of supervision**

① At the same time, environmental supervision units is responsible for the construction unit and the environmental protection administration department;

② Environmental Supervision staff jointly with construction unit personnel written documents of environmental supervision, including logs, monthly, interim reports, annual reports;

③ The environmental supervision unit should carry on the essential environmental monitoring according to need in the construction process;

④ With comprehensive, put forward the proposal to other project aspects within the category of environmental protection.

8.3.2 Environmental Supervision procedures and responsibility

**Environmental supervision procedures**

① Environmental supervision plan should be established in accordance with the environmental impact assessment documents and the approval from the
environmental protection administrative department director;
② Based on the progress of construction projects, the implementation details of the environmental supervision established according to single measure;
③ Implement supervision according to supervision implementation details, regularly report to the project construction unit the supervision and report on a special topic;
④ The environment supervision unit should send quarter supervision to the examination items of basic construction Environmental protection department to report quarterly that presents the pollution incident to send the supervision report daily to the Environmental protection department;
After completing the environmental supervision of the construction project, send the environmental supervision report and Hand over archives material to the construction unit.

The environmental supervision responsibilities
In accordance with relevant environmental protection laws and regulations, bidding documents, environmental supervision plan and environmental impact reporting requirements, the environmental supervision duty personnel should regulate the construction process and project management, supervise construction units to implement environmental protection measures, and is responsible for collecting the documents, archives, and archiving, filing, then reporting those relevant to the environmental supervision, in order to lay the foundation for acceptance of environmental protection of the construction projects successfully.

8.3.3 Environment supervision organization
The environment supervision organization should meet the following conditions:
(1) Registered in the People's Republic of China, various types of corporate ownership, or the cause of corporate that have fixed places of work and working conditions, the fixed assets of not less than 2 million, among them industrial corporate registered capital of not less than 500,000 yuan.
(2) With the qualifications for construction projects environmental impact assessment;
(3) With an appropriate number of professional and technical personnel of engineering analysis, environmental engineering, ecology, civil engineering and so on;
(4) With the corresponding amount of the professional and technical personnel trained by the environmental protection business or bid for each construction site of not less than one person);
(5) Equipped special instruments and equipments with the same work scope of environmental supervision, and with documents and digital image processing capability, and better computer network systems and file management system.

8.3.4 Environmental supervision content

Construction of the project cycle by taking 5 years, the engineering supervision of the work environment are the main environmental protection measures during construction period, as well as project-based pollution control facilities supporting the "Three at the same time" to supervise the implementation of job, mainly related to:

- Environmental supervision of the preparation phase of construction
  Supervision mission of this phase is the preparation of environmental supervision details, auditing construction contract provisions in the environmental protection, engineering design, construction period the contractor environmental management plans and construction of environmental protection measures designed to verify the relevant technical documents and plan in compliance with environmental requirements.

- Environmental supervision in the construction phase
  The content of environmental supervision in construction process is mainly supervises the construction units to carry out environmental protection measures, and regulate the construction process which in the environmental effect report proposed. The main points of environmental supervision in the project construction phase as shown in Table 8-3-1.

<table>
<thead>
<tr>
<th>Environment impact</th>
<th>Environment supervision key actual content</th>
<th>Implementing agency</th>
<th>Responsible agency</th>
<th>Cognizant agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wastewater</td>
<td>1. The sanitary sewage from construction camp must collected and discharged into the sewage pipe network; 2. Sedimentation pool, oil separation tank and etc. would be conducted after construction wastewater containing oily and suspended solids must be treated and disposal up to the designed standard; it may discharge.</td>
<td>Construction units</td>
<td>Project units</td>
<td>Construction supervision, Environmental Shenyang Environmental Protection Bureau and Shenyang Economic Development</td>
</tr>
</tbody>
</table>

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### High Performance Radial Tires Environmental Protection Relocation, Renovation and Extension Project

<table>
<thead>
<tr>
<th>Environment</th>
<th>Measures</th>
</tr>
</thead>
</table>
| **Exhaust gas** | 1. During the construction, construction site should be surrounded to reduce dust pollution.  
2. Transportation vehicles must be covered tarp, construction road regularly spray water to reduce construction dust. |
| **Noise** | 1. Forbid to construct at night  
2. Control the construction noise, the noise of construction machinery temporary measures should be taken to ensure sound insulation construction field bounded noises. |
| **Solid waste** | 1. Living garbage should focus on stage, unified transporting disposal.  
2. Construction waste collection and transported to a centralized government designated location. |
| **Ecology** | 1. Construction temporary land should clean up promptly, when construction conclusion duplicate plants;  
2. Refuse to take the earth, the abandoned dregs at will, takes, and waste should be according to the municipal administration stipulate that the unification. |
| **soil** | 1. The seriously polluted surface layer earth shall be handled as the national hazardous waste, and can not be discharged as will. Green the bare land, cover the soil imported from other places to avoid the secondary heavy metal pollution by the dust. |

- Supporting prevention and control of pollution measures and the supervision to the implementation of "three at the same time".

Supervise the technology, equipment, scale, the progress as pollution control measures in the operation period that approved in EIA report and its approval. Implement the supervision work effectively according to the requirements for design documents, the environmental protection engineering effectively implemented.

### 8.3.5 Environmental supervision accident treatment

The environmental supervision personnel should report the project units and the environmental protection administration department director promptly if they found the following problems when in the items of basic construction;

1. In the project construction process exist environment illegal activity such as surpassing
the national or local environmental standard emission pollutant;

(2) In the project construction process has the pollution to harass people's situation;

(3) The facilities of Environmental pollution treatment and environmental risk prevention are not implemented in accordance with requirements in environmental impact assessment and its approval, and the construction projects do not meet the requirements of environmental protection "Three at the same time".
9. Profit and Loss Analysis of Environmental Economy

The profit and loss analysis of environmental economy is to discuss the feasibility of the project from the unified views of economic benefits, environmental benefits, social benefits. Combined with the characteristics of the project, the evaluation analysis is from the following sides.

9.1 Environmental benefits

9.1.1 Environmental protection investment

The environmental protection investment of this project is about 313.13 million yuans RMB or 45.7 million U.S. dollars. For the specific estimation calculation of the environmental protection investment on items in detail, see Table 9-1-1.
### Table 9-1-1 Environmental Protection Treatment Facilities

<table>
<thead>
<tr>
<th>Category</th>
<th>Main treatment device</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wastewater</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collection system</td>
<td>Rain, clear water and sewage drainage networks and a variety of pumps</td>
<td>Incorporated into the project budget</td>
</tr>
<tr>
<td></td>
<td>Rainstorm collecting pool</td>
<td>Incorporated into the project budget</td>
</tr>
<tr>
<td>Water Reuse System</td>
<td>Sand filter tank, heat exchanger, condensing machine</td>
<td>Incorporated into the project budget</td>
</tr>
<tr>
<td></td>
<td>Water reuse systems network construction</td>
<td>Incorporated into the project budget</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Water amount, COD online monitoring equipment</td>
<td>Incorporated into the project budget</td>
</tr>
<tr>
<td>Emergency Response</td>
<td>Rain water collection pool set up a waste water collection treatment pool for proof-fire, waste water switch valve for proof-fire</td>
<td>Incorporated into the project budget</td>
</tr>
<tr>
<td>System</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Waste gas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conveyor system</td>
<td>waste gas collection and exhaust system in the plant</td>
<td>Incorporated into the project budget</td>
</tr>
<tr>
<td>Waster gas processing</td>
<td>Dust removal system (including bag filters, polyester bag filter etc.)</td>
<td>Incorporated into the project budget</td>
</tr>
<tr>
<td>equipment</td>
<td>Smell processing</td>
<td>Incorporated into the project budget</td>
</tr>
<tr>
<td><strong>Solid waste</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collection device</td>
<td>Waste area for the classification and re-use solid waste storage</td>
<td>Incorporated into the project budget</td>
</tr>
<tr>
<td></td>
<td>Collection device on production equipment (liquid collection pool and collection tank etc.)</td>
<td>Incorporated into the project budget</td>
</tr>
<tr>
<td>Storage facility</td>
<td>General solid waste storage</td>
<td>Incorporated into the project budget</td>
</tr>
<tr>
<td></td>
<td>Hazardous waste storage</td>
<td>Incorporated into the project budget</td>
</tr>
<tr>
<td><strong>Noise</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment in equipment</td>
<td>The low-noise alternative equipment, mufflers, acoustic covers, cushion etc.</td>
<td>Incorporated into the project budget</td>
</tr>
<tr>
<td><strong>Underground water</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering investment</td>
<td>Plant house sound insulation</td>
<td>Incorporated into the project budget</td>
</tr>
</tbody>
</table>
The investment on environment protection of Michelin mainly for filters, gas collection and transportation system, which are purchased together with the equipments, and this investment has been listed into the equipment investment; Michelin lists the foundational projects, such as waste storehouse, engineering anti-leakage, plant house sound insulation, shock absorption of equipment foundation, rainstorm puddle, accident puddle and ank cofferdam, into the project budget, there is no single list or separation, covering in the construction investment.

9.1.2 Environmental benefits

According to the evaluation of pollution control measures, the project takes the control facilities for wastewater, waste gas, noise and other pollution, which can achieve effectively the control of pollution and the environment protection. The environmental benefits of control pollution facilities in the project are primarily showing in the following areas:

(1) The environmental benefits of wastewater treatment

Setting up of water reuse treatment facilities can realize effective former water treatment, which can save water resources.

(2) The environmental benefit analysis of waste gas treatment

Waste gas is one of the main pollution sources for this project and is also the environmental impact factor that the public is more concerned. Atmospheric control measures of the project are the treatment method of stable effect and convenient running management in the domestic same industry and the mixing treatment of
smoke uses an international advanced RTO odor treatment system, which effectively reduces the odor emissions in mixing smoke. After the treatment by appropriate measures, the pollutants meet the requirements of emission standards. Through predictive analysis, we can see that an impact of a variety of emissions of pollutants on air quality of the surrounding environment may be controlled within the standard allowing scope.

(3) The environmental benefit analysis of noise treatment

The production process of the project involves a lot of middle and low frequency and high noise equipment, if it is not treated effectively, the surrounding environment sound quality will be impacted in a certain degree, we take the noise pollution control measures with high targets, such as cooling towers, fans, pumps, air compressor of a low noise, the installation of muffle on pipelines of fan, air-conditioning, air station with muffler bends, the use of acoustic windows and doors of nitrogen station, pumping station etc. noise reduction measures. By means of the measures, the noise impact on the surrounding environment in the production process is minimized to ensure enterprises noise emission to reach at the standards and the sound quality of the surrounding environment will not be affected.

(4) The solid waste generated by the project is utilized or treated 100% and the effect on the surrounding environment is a little. This shows that the investment in environmental protection may ensure the saving water resources and ensure the pollutants emission reaching at standards, which will make the impact on the surrounding environment minimized and the environmental benefit is very obvious.

In addition, Michelin Company is worshiping the green concept and does product design based on the tire's life cycle analysis results. The tire's life cycle analysis results show that the use process of the tire is the biggest stage of the environmental impact. The rolling resistance in car driving process is the important influencing factor of fuel consumption and automobile exhaust emissions, Michelin Company used silicon materials in tire tread at first time and resulted to the birth of the Michelin green tires. This technical innovation reduces about 30% of tire rolling resistance and saves more than 4% of fuel, which is equivalent to 3 to 5% savings of
carbon consumption and reduces greenhouse gas CO₂ emissions in tire use process significantly. Under the premise of no changing other properties (such as use cycles, braking distance), a new generation of green tire Energy Saver of Michelin remains to be committed to reducing rolling resistance, which is the best tire in Europe magazine and is applied to new low fuel consumption vehicle. The tire produced by this project is just this green tire.

Another impact environmental factor during tire life cycle is noise. Michelin has done a depth study on tire size and tread pattern. By means of the tire size reasonable design and the tread pattern irregular design, it may reduce noise when the tire contacts road surface.

Summing above analysis up, the environmental benefits of the project is highlighted.

9.2 Social benefit analysis

The implementation of the new plant construction project of Michelin Shenyang Tire Co., Ltd. is to move into the chemical industry cluster from the current urban resident concentration area, which will solve the problem that the old site closing the residential area leads to conflicts with neighboring residents and improve the urban environment quality effectively and is conformed to urban development general planning in Shenyan.

Because the project uses advanced, reasonable and reliable process technology and pollution control means, it substantially reduces the emissions of various pollutants. At the same time, the economic benefits of the project are good. Except certain profits and taxes are turned over to nation, it also promotes the development of related businesses in the region and contributes to local economic development.

As the project is completed and put into production, it will provide more jobs to local residents. At the same time, it will promote the local production development of related industries, which will bring more indirect employment opportunities.

To sum up, after the implementation of the construction projects, it not only reduces the environmental pollution, but also avoids the risk of the environmental
pollution and the nuisance to the public and profits the improvement of the urban environmental quality and the living quality of surrounding residents and achieves good economic results, which is entirely in line with three unification principles of China's environmental management of economic, social and environmental benefits. At the same time, it is also in line with the basic principles of the sustainable development of economic and environmental coordination. Therefore, the construction project is feasible in the three sides of economic, social and environmental benefits.

10. Assessment Conclusions

10.1 General survey of the project

The area where the original site of Michelin Shenyang Tire Co. Ltd. is located has now been changed into a residential area and is no longer suitable for further production and expansion as it has been surrounded by the newly-built residential quarters in the last few years. The Company is to be relocated to Shenyang Chemical Industry Park and its production scale of environmentally-friendly high-performance radial tire will be enlarged through relocation transformation and adjustment of product mix; the annual capacity of truck and bus tires will be increased from 800000/a to 1.8 million/a; that of car tires from 2.2 million/a to 10 million/a in addition to the retreading (truck and bus) capacity of 295000/a. The new factory will be equipped with world-advanced technology and equipment and environmental problems cropped up in the existing factory will be solved. The technical and managerial level of pollution prevention will be improved in an all-round way. As the principles of energy conservation and emissions reduction and carrying the old with the new are followed, the project will yield great social, economic and environmental
benefits.

10.2 Environmental quality status in the region

The average daily mean of PM$_{10}$ at each monitoring site for conventional pollutants during the heating period in the area under assessment exceeded the standard at a standard-exceeding rate of 14% ~ 71% with a maximum multiple of 0.27; average daily and hourly concentrations of NO$_2$ and SO$_2$ meet the requirements set forth in the Air Quality Standard (GB3095-1996) for Grade II while the Pmax of average daily and hourly concentrations of SO$_2$ stands at 45% and 15% respectively and that of average daily and hourly concentrations of NO$_2$ at 75% and 58% respectively. The Pmax of the primary value of the characteristic pollutant NMHC is 3% and that of xylene, styrene and CS$_2$ is not detected.

The Pmax of average hourly concentrations of the characteristic pollutant NMHC and TSP at the upwind and downwind boundary of the factory area to be constructed stands at 2% and 25% while that of benzene, xylene, styrene, CS$_2$ and odor concentration has not been detected.

COD$_{cr}$, amino-nitrogen, petroleum and total phosphate at the monitored section of Xihe River for water quality surpassed the limits for Grade V set in the Environmental Quality Standard for Surface Water (GB3838-2002), of which COD$_{cr}$ had a maximum exceeding multiple of 1.75, amino-nitrogen 5.1, petroleum 3.49 and phosphate 1.9, indicating that Xihe River is polluted seriously by organic pollutants, the principal character mainly is organic contaminant.

The monitoring results of the well water quality for residents around the factory site show that of the 15 indicators to be monitored, except for Mn content of Sanmangniu village in excess of the limits for Grade III, the rest at other sites meet the requirements for Grade III set in the Groundwater Quality Standard. Mn in Sanmangniu village in excess of the standard has something to do with the location of Shenyang region in the geological zone with high concentration of iron and manganese in the Liaohe river basin and this is geological structural pollution.

The monitoring results of groundwater in the factory area show that all the items monitored meet the requirements for Grade III set in the Groundwater Quality
Standard (GB14848-93).

Both the diurnal and nocturnal noise pollution level round the factory site to be constructed meets the requirements for Grade III set in the Acoustic Environmental Quality Standard (GB3096-2008).

⑤ The soil of the Chemistry Industry Park where the new factory site is to be selected is Cd-polluted area, most of which has been polluted by Cd to varying degree with a standard-exceeding rate of 77.8% due to urban sewage irrigation which started since 1950s. The monitoring results of soil within the factory area show Cd at the 27 sites within the boundary exceeded the Soil Environmental Quality Standard (GB15618-1995), but met the Environmental Quality Risk Assessment Criteria for Soil at Manufacturing Facilities (HJ/T25-1999), indicating the project land has also been polluted by Cd. Benzo(a) pyrene at Site No. 8 in the boundary exceeded the Environmental Quality Risk Assessment Criteria for Soil at Manufacturing Facilities (HJ/T25-1999).

10.3 Major environmental impact factors of this project

Tire manufacturing is composed of two parts: milling (mixing) and tire production (extruding, calendaring, cutting, bead, shaping, vulcanization and inspection); retreading refers to curing of tread after mixing and extruding. The supporting public works and auxiliary facilities mainly cover storage and supply of raw materials and supply systems of steam, cooling water, nitrogen and compressed air.

A large amount of carbon black and other dust are generated in such processes as unloading of carbon black and auxiliary materials, transport, weighing and charging; in the processes of milling, calendaring and extruding, smoke is produced because of high temperature and intense mechanical action and contains multiple elements, including NMHC and odorous gases in addition to carbon black and other dust; in the process of curing vulcanization smoke is released and it mainly contains NMHC and odorous gases. The composition of discharge from this project is simple and mainly covers discharge from cooling system, steam condensed water and domestic sewage. The solid wastes generated are mainly composed of packages of raw and auxiliary
materials, dust collected by dusters and scrap rubber stock. Noise mainly comes from the production equipment in the shops and power equipment in the power station as well as cooling tower.

10.4 Major EP measures to be adopted in the construction

Control measures against air pollution

At each dust-generation point dust filter will be used cloth bag dusters are laid with a dusting efficiency of 99%; the milling smoke is removed by the regenerative heating oxidizer (RTO) with an efficiency of 98% for VOC and 90% for odor while the vulcanization smoke is discharged through exhaust tubes by a big draught hood. According to Odor Pollutants Emission Standard, the height of odor organized emission source exhaust tube should ≥ 15m.

Countermeasures against water pollution

Recycled water station will be set up to cool and filter the direct cooling water for extruder face and condensed water before being used as replenishment water for cooling water and the utilization of recycled water reaches 39.1% in winter and 57.7% in summer on an average annual rate of 45%.

Both domestic sewage and blowdown water from the circulating water system meet the Comprehensive Emission Standard for Sewage in Liaoning (DB21/1627-2008) and are directly discharged into the sewage treatment plant of the Chemistry Industry Park for unified disposal.

Countermeasures for control of solid wastes

SW shall be collected by classification and ordinary industrial SW sold for comprehensive utilization; hazardous waste shall be sent to Shenyang Zhenxing SW Disposal Company for harmless treatment; thus all the SW from the Project can be handled properly.

Control measures against noise pollution

Such measures shall be taken as adoption of low-noise equipment, soundproof and silence factory buildings, damping of equipment foundation and optimization of general drawing arrangement.

Measures against risks

Auto-inspection and alarm devices shall be set up in such hazardous places as the
rubber latex house and sulfur storeroom. A cofferdam shall be built in the oil tank area and in the factory storm gathering tank a space should be left for collection of accident waste water with a capacity big enough to accommodate all the waste water from accidents to ensure it discharge into the sewage treatment plant of the Chemical Industry Parks after meeting the specified standard through treatment in the factory. A sound risk emergency plan should be made to minimize accident harms.

10.5 Environmental feasibility of the engineering construction

(1) Conformity with the industrial policy

This project is mainly for production of high-performance car and truck radial tires by using Michelin’s unique design and processes, which feature environmentally-friendly performances including long service life, less oil and lower noise.

In line with the Catalogue of the State Industry Structural Adjustment (2005) (No. 40 Decree of the State Development & Reform Commission), production of high-grade radial tires belongs to the industry whose development is encourage by the State;

In line with the Industrial Catalogue Guiding Foreign Investment (revised in 2007) (No. 57 Decree of the State Development & Reform Commission and Ministry of Commerce) this project doesn’t belong to the foreign-funded projects restricted (retreading) or prohibited by the State;

In line with the Catalogue of Priority Industries for Foreign Investment in Liaoning Province (No. 47 Decree of the State Development & Reform Commission and Ministry of Commerce), production of radial tires belongs to the projects of encouraged industries;

In line with the Catalogue of Priority Industries for Foreign Investment in the Mid-West Region (revised in 2008), high-performance radial tires production belongs to the projects of priorities industries in Liaoning Province.
(2) Conformity with relevant planning

The area where the actual site of Shenyang Michelin Tires Co. Ltd. is located has now been changed into a residential area and is no longer suitable for continuous production and expansion as it has been surrounded by the newly-built residential quarters over recent years. Shenyang Chemical Industry Park is the industrial area that takes the lead in starting business within Shenxi Industry Corridor except for the Core Area of Advanced Equipment-Manufacturing Industry that has begun to take shape. It is based primarily on the Rubber Industry, coal chemical project, fuel oil project and project for new chemical materials and special chemicals, supplemented with construction of such public and auxiliary facilities including a heating power station, a sewage treatment plant and a public works island. Relocation of Michelin Shenyang Tire Co., Ltd. from the urban district to Shenyang Chemical Industry Park is in accordance with the overall urban development plan for Shenyang and planning for Shenyang Chemical Industry Park and also conforms to the requirements for environmental assessment for Shenyang Chemical Industry Park.

(3) Clean production level

In this project toxic and deleterious raw materials are phased out and the products boast outstanding performance as world advanced production technologies and equipment are adopted and utilization indicators of resources and energy reach international advanced level. Compared with the exiting project, this one will save energy by 14.56% and water by 72% with less emissions of pollutants and full disposal or utilization of SW. The enterprise has a sound environmental management system and experience. Therefore its clean production will reach international advanced level of our counterparts.

(4) Emissions up to standard

After adoption of control measures against pollution, the maximum emission concentration of CB dust and other dust from this project will be less than 9mg/m³ and 15mg/m³ respectively, lower than the limits set in the Comprehensive Emission Standard for Air Pollutants. Milling smoke is treated by RTO with removal of VOC at 98% and odor at 90% and the pollutant concentration meets the standard; Waste water discharge meets the Comprehensive Emission Standard for Sewage in Liaoning
(DB21/1627-2008) and take-over standard of the sewage treatment plant of Chemical Industry Park; Ordinary industrial SW is utilized comprehensively and all the hazardous wastes are sent to qualified work units for safe disposal; boundary noise pollution level meets the requirement for Grade III set forth in the Emission Standard for Industrial Enterprises Noise at Boundary (GB12348-2008).

(5) Environmental impact

Dust from the Project exerts a small impact upon each sensitive point, but the superimposed value of PM\(_{10}\) at each sensitive point in the assessment area exceeded the standard to varying degree because the sensitive points are the residential quarters, monitoring is conducted in the winter heating period and the smoke from coal-fired boilers leads to the above-norm background value of each sensitive point PM\(_{10}\) directly.

The hourly, daily and annual averages of the maximum ground concentration of PM\(_{10}\) in the evaluation area stand at 15.68\(\mu\)g/m\(^3\), 2.95\(\mu\)g/m\(^3\) and 0.53\(\mu\)g/m\(^3\) respectively and their location is within the factory boundary separately with daily average maximum concentration accounting for 1.97% of the standard.

After operation of the construction project, the superimposed value of discharge exhaust organic gas the air pollutants discharged (NMHC, composite odor and composite odor constituents) at the downwind (dormitory of Heping Tire Company) and upwind boundary can all meet the standard for Grade II set in the Air Quality Standard (GB3095-1996), maximum permissible concentration of deleterious substances in the air of residential area set in the Hygienic Standard for the Design of Industrial Enterprises (TJ36-79) and Emissions Standard for Odorous Pollutants.

The unorganized discharge of this project without overproof point, so there is no necessary to set air environmental protection scope, and health protection scope includes the mixing treatment work shop (the construction No. is 432/442/431/441): 100m, the truck vulcanization work shop (construction No. is 660): 330m, and the car vulcanization work shop (construction No. is 640): 200m.

To sum up, implementation of the project will have little effect upon the air quality in the whole area under assessment and won’t worsen the local air pollution
either.

② After adoption of control measures for noise pollution the predicted boundary noise level will meet the requirement for Grade III set in the Emission Standard for Industrial Enterprises Noise at Boundary (GB12348-2008) and after superimposition of the background value can meet the requirement for Grade III in the Acoustic Environmental Quality Standard GB3096-2008.

③ Waste water from this project is discharged into the sewage treatment plant of the Shenyang Chemical Industry Park. Based on the analysis of quality of drainage discharged and process analysis of Chemical Industry Park Sewage Treatment Plant, drainage water quality can meet the plant’s requirements for influent and won’t produce any bad effect upon normal operation of the sewage treatment plant.

④ Once an unexpected blowdown accident occurs to the project area after anti-corrosive and water tight measures are taken in such parts that are liable to pollute soil and groundwater as rejects storeroom, sulfur warehouse and oil tank zone, the effect upon groundwater will be reduced to the negligible or undetected level and won’t exert significant influence upon the groundwater environment in the region.

⑤ Ordinary solid waste from the construction project will be put to comprehensive utilization and deleterious solid waste will be sent to the qualified work units for safe disposal and therefore solid waste from this project will pose no danger to the environment.

(6) Environmental risks

Identification of the dangerous substances and major source of danger shows that this project has no major source of danger despite of some hazardous substances such as sulfur and gasoline in stock. The most believable accident is fire explosion in the gasoline warehouse or sulfur storeroom. Through accident source term analysis the risk level of fire explosion in this project stands between $10^{-5} \sim 10^{-4}$ times/a. Adoption of risk control measures can prevent occurrence of any accident to a maximum and the measures against risks and emergency response plan that will be formulated and improved continuously in the subsequent design and operation of the enterprise will reduce the probability of risk accident in this project to $< 10^{-5}$ times /a to an acceptable level. The fire sewage will be piped to the sewage treatment plant of the Chemical Industry Park after collection and pretreatment in the factory instead of entering the
water bodies on the ground directly. So the most believable accident risk of this project is acceptable.

(7) Aggregate control

The aggregate control indicators of pollutants during the Eleventh Five-Year Plan period issued to Michelin Shenyang Tires Co. Ltd. by Shenyang Economic & Technological Development Zone: COD 44.8t/a, SO2 203.76 t/a and smoke 180.2 t/a.

After relocation, transformation and expansion of this project, aggregate discharge of COD will come to 50.361t/a, an increase of 5.561 t/a over the aggregate control figure stipulated in the Eleventh Five-Year plan. As Shenyang EP Bureau has not issued the aggregate emissions reduction figure for the Twelfth Five-Year plan to Shenyang Economic & Technological Development Zone yet, the newly-added aggregate COD from this project will be distributed from the emissions reduction of Shenyang Southern Urban Sewage Treatment Plant that is under construction and included in the task of emissions reduction for the Twelfth Five-Year plan period. After treatment in the sewage treatment plant of the Chemical Industry Park, the aggregate COD discharged into the recipient waterbody—Xihe River actually comes to 17.47t/a.

The steam for this project will be supplied by Shenxi Heating Power Plant, and after the relocation, the emission of dust and SO$_2$ is reduced significantly.

The coal-fired boilers available will be used continuously for supply of steam before shutdown of the old factory area until it is fully removed. At present the pollutants discharged from the boilers of the old factory have exceeded the aggregate control indicators and with relocation going on, production scale will be reduced year by year beginning with the year of 2013. It is predicted that by 2016 the pollutants will be lower than the aggregate control indicators for the Eleventh Five-Year Plan. In consideration of the actual situation of ensuing relocation of the old factory the EP Bureau of Shenyang Economic & Technological Development Zone gave a reply to Michelin Shenyang Tires Co. Ltd. in the document of SHJF [2009] No. 8, agreeing that before completion of relocation desulfurizers and dusters in current use can be operated as usual, actual discharge of SO$_2$ from boilers must not be in excess of 327t/a and smoke not over 180t/a and the portion in excess of the emissions reduction...
target shall be regulated by the emissions reduction target of the thermoelectrical powder plant of the development district.

Two public announcements were made in the environmental assessment process of this project by publishing official notices in Liaoning Daily and no comments were fed back from the public in the time limit set by the two announcements, and it is deemed as no objection.

Overall, this project is in accord with the industrial policies of the State and the locality and the site selection in Shenyang Chemical Industry Park meets the requirements set in the overall urban development plan for Shenyang, overall plan for Shenyang Chemical Industry Park; the energy source and water resources required in the project are secured; after the administrating committee of the Chemical Industry Park carries out overall relocation of the peripheral residential area, the sensitivity of engineering environment will be reduced greatly; plan layout of the project meet the requirements for environmental protection.

This project features advanced process technology, equipment and management and its clean production has reached world advanced level; pollution prevention and control measures are reliable and waste gas and water, noise and solid waste can all be discharged up to the standards steadily and disposed of safely; the environmental impact prediction shows that this project will exert a minor effect upon its surroundings after completion and operation; after relocation and transformation aggregate discharge of pollutants will be reduced greatly; the preventive and emergency measures against accidents are perfect and feasible and environmental risks are acceptable; the general public supports the construction of the Chemical Industry Park and has no objection to this project.

From the perspective of environmental protection this project is feasible.