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**China POPs Waste Environmentally
Sound Management & Disposal
Project**

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**POPs Hazardous Waste High-temperature Incineration
Enterprise General Management & Disposal Capability
Evaluation Method**

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Commissioned by: Foreign Economic Cooperation Office (FECO) under the Ministry
of Environmental Protection

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Implementation Rules of POPs Hazardous Waste High-temperature Incineration Enterprise General Management & Disposal Capability Evaluation

(Proposal)

Chapter I General Provisions

- Article 1** This Method is formulated in order to regularize the selection and evaluation of POPs waste incineration enterprise(s) for the “China Pesticide POPs Waste Environmentally Sound Disposal Project” (hereafter referred to as “the Project”) to ensure the advancement of environmentally sound management & disposal of pesticide POPs waste.
- Article 2** Enterprise(s) applying for POPs waste high-temperature incineration should participate in corresponding evaluation as required by this Method, including preparing application report and related documents, and coordinating with other relevant work as per evaluation requirements.
- Article 3** As the domestic executing agency of the Project responsible for evaluation organization and implementation, the Foreign Economic Cooperation Office (FECO) under the Ministry of Environmental Protection is responsible for carrying out related work in a comprehensive way as per requirements from the Global Environmental Funds (GEF) and the international executing agency of the Project.
- Article 4** The evaluation on POPs waste high-temperature incineration enterprise(s) should be carried out following the principle of legitimacy, impartiality and objectivity with responsible evaluation results.

Chapter II Evaluation Organization

- Article 5** The main responsibilities of FECO include: developing technical and managerial requirements for POPs waste high-temperature incineration disposal technology; establishing methods for evaluating the general management & disposal capability of POPs waste high-temperature incineration enterprise(s); determining evaluation agency and signing written commission contract; reviewing evaluation implementation program and list of evaluation experts; supervising the implementation of evaluation; accepting representation, reviewing evaluation report and publishing evaluation results, etc.
- Article 6** The evaluation agency should, based on the requirements of commission contract, organize and carry out evaluation on POPs waste high-temperature incineration enterprise(s) independently. Its main responsibilities include: accepting evaluation application, establishing expert database, making evaluation implementation plan, drafting list of evaluation experts; organizing and carrying out communication/on-site/comprehensive evaluation, and submitting evaluation report, etc.
- Article 7** The main responsibilities of POPs waste high-temperature incineration enterprise(s) include: coordinating with the evaluation organization work, preparing authentic and accurate application documents and submitting them to the evaluation agency on time.
- Article 8** Based on relevant state laws, rules, regulations and policies, evaluation or review activities should be carried out strictly in accordance with provisions, procedures and methods related to project evaluation/review work to make evaluation on disposal enterprise(s) or put forward improvement suggestions following the principle of independence, objectivity and impartiality, and welcome the supervision from parties concerned.

Chapter III Basic Contents of Evaluation

- Article 9** Evaluation on specific enterprise(s) applying for POPs waste disposal should be carried out by focusing on both “hardware” and “software” conditions, including the basic operation conditions of

the enterprise(s), the operation process of incineration facilities, the configuration and operation effect of pollution control facilities, as well as safe production and labor protection measures.

Article 10 Evaluation on the basic operation conditions of disposal enterprise(s) should at least include the following:

- (1) Organizational structure and staffing of the disposal enterprise(s), and its/their conformity with relevant policies, regulations and standards.
- (2) Application and renewal of hazardous waste operation license.
- (3) Hazardous waste incineration technology, process and engineering acceptance situations.
- (4) Regulation establishment & implementation situations in hazardous waste centralized incineration unit(s). At least there should be regulations on facility operation and management recording, shift hand-over & take-over recording, hazardous waste acceptance and management, hazardous waste analysis, internal supervision and management, facility operation procedures, laboratory (lab) specific pollutants testing program and implementation rules, emergency plans for disposal facility operation accidents, safe production and labor protection management, personnel training and environmental monitoring, etc.
- (5) Emergency plans for accidents and their implementation in hazardous waste centralized incineration unit(s).

Article 11 Evaluation on the management capability of incineration “hardware” facility operation should at least include: hazardous waste acceptance, hazardous waste analysis and identification, hazardous waste in-plant storage and pretreatment, and hazardous waste incineration facility operation, etc.

- (1) Evaluation on hazardous waste acceptance mainly includes: dedicated channels and identification for hazardous waste transportation, hazardous waste pre-inspection, the implementation of hazardous waste transfer manifest system, and hazardous waste unloading.
- (2) Evaluation on hazardous waste analysis and identification should mainly include: basic analysis and identification conditions, hazardous waste identification items, hazardous waste registration following characteristics identification, storage/sampling/analysis of characteristics identification data, and hazardous waste classified management.
- (3) Evaluation on hazardous waste storage facilities should include hazardous waste storage containers and the conditions of the facilities.
- (4) Evaluation on hazardous waste incineration system should include the configuration and operation procedures of the incineration facilities.
- (5) Evaluation on subsidiary facilities for hazardous waste disposal should include: pretreatment and feeding system, heat energy utilization system, flue gas purification system, slag and fly ash handling system, automatic control and online monitoring system, etc.

Article 12 Evaluation on configuration and treatment effect of pollution control facilities should at least include the following:

- (1) Performance evaluation of incineration facilities should be carried out in according with procedures and methods specified by the Technical Specification for Performance Testing of Hazardous Waste (including Medical Waste) Incineration Facilities (HJ561).
- (2) Whether the incineration facility performance indicators and air pollutants emission control indicators can meet the requirements of Pollution Control Standard for Hazardous Wastes Incineration (GB18484), including whether the dioxin monitoring indicators can satisfy the $0.1\text{ngTEQ}/\text{m}^3$ standard limit, and whether indicators of ambient air quality around the plant can meet the requirements of Ambient Air Quality Standard (GB3095).
- (3) Slag/fly ash from hazardous waste incineration and used active carbon/filter cakes from incineration waste gas handling, etc. are hazardous waste. Whether the enterprise(s) has/have corresponding managerial and technical measures for environmentally sound management and disposal of such waste.
- (4) Whether the wastewater discharging of incineration unit(s) can meet the requirements of Integrated

Wastewater Discharge Standard (GB8978).

- (5) Whether the noise emission from incineration unit(s) can meet the requirements of Standard of Noise at Boundary of Industrial Enterprises (GB12348).

Article 13 Evaluation on safe production and labor protection should at least include the following:

- (1) In terms of safe production, whether an incineration unit implements the Technical Specifications for Hazardous Waste Centralized Incineration Facilities Engineering (HJ/T176) and other state regulations related to safe production.
- (2) In terms of labor protection, whether an incineration unit implements the Technical Specifications for Hazardous Waste Centralized Incineration Facilities Engineering (HJ/T176) and other state regulations related to labor production.

Article 14 In addition to the above technical aspects, evaluation on disposal enterprise(s) should also include the following management elements:

- (1) Compliance of disposal application report form. In general, it includes whether the application report is complete, authentic and reliable; whether the waste disposal is in line with national policies and the direction and scope of project related financial support; whether the implementation of waste disposal is in conformity with local industrial policies and the business scope of the disposal unit(s).
- (2) Rationality of project objectives and implementation plan. It includes whether the project objectives and implementation plan are clear; whether implementation guarantee measures are carried out.
- (3) Basic qualifications and project organization & implementation capabilities of the applying enterprise(s).

Article 15 Project related financial evaluation should include the following:

- (1) Whether the budget preparation process, contents and standard meet relevant requirements;
- (2) Waste disposal funds and the sources of funds;
- (3) Establishment and implementation situations of financial management system;
- (4) Financing of supporting funds;
- (5) Analysis of the benefits and prospects of funds expenditure.

Article 16 Local management and basic conditions should be considered as important factors, mainly including local management requirements for and attitudes to the disposal of pesticide POPs waste transferred into the city where a disposal unit is located, and local pesticide POPs waste supervision and management conditions.

Chapter IV Evaluation Procedures & Methods

Article 17 The evaluation agency should, in accordance with this evaluation Method and the requirements of disposal tender documents, make detailed evaluation implementation plan and prepare necessary operational documents, and submit them to FECO for review.

Article 18 The evaluation agency should establish an expert database involving scientific research institutions, government departments and enterprises based on the characteristics of the Project. The professional fields of experts should cover environmental science and engineering (including hazardous waste disposal and management, environmental monitoring and pollution control technology, etc.), chemistry and chemical (including hazardous chemical properties and safe handling, etc.) and operation of hazardous waste incineration facilities (including the collection, transportation, management and disposal of hazardous waste) and so on.

Article 19 The evaluation agency should select 7 to 9 experts from the expert database to carry out the evaluation work. The evaluation experts selected should come from science research institutions, government departments and enterprises, covering professional fields such as environmental science and engineering, chemistry & chemical and environmental protection. The selection ratio is decided based

on specific circumstances.

Article 20 The disposal enterprise evaluation should strictly follow avoidance system. The evaluation agency should make a list of persons who should avoid taking part in the evaluation. Anyone having direct interest relations with a POPs waste high-temperature incineration enterprise is not allowed to take part in on-site evaluation. The enterprise(s) to be evaluated may also put forward a list of persons whom they think should avoid taking part in the evaluation with reasons, and submit the list together with the evaluation application.

Article 21 The evaluation process includes three stages: document preparation by the disposal enterprise(s), on-site investigation and comprehensive evaluation.

- (1) Disposal enterprise(s) should prepare documents closely based on the general objectives and requirements of the tender notice, and prepare the application report by considering its/their actual conditions. The application report should focus on the basic enterprise conditions, the technical conditions of disposal facilities, the management capability of the disposal unit(s), project implementation plan and project related financial quotes, etc.
- (2) The core purpose of on-site investigation is to investigate the general management & disposal capabilities of the applying unit(s) by focusing on the basic enterprise operation conditions, the operation process of incineration facilities, the configuration and operation effect of pollution control facilities, as well as safe production and labor protection measures, so as to decide whether the technology, management, economic conditions and environmental effectiveness of the disposal enterprise(s) can meet the requirements for pesticide POPs waste disposal. On-site evaluation is carried out by an expert panel, involving inspection and investigation of POPs waste disposal facilities, forums and individual interviews. At any time during on-site evaluation, evaluation experts may inquire or ask questions to members of the enterprise(s) applying for the disposal.

Article 22 The comprehensive evaluation is carried out by the evaluation agency. The comprehensive evaluation expert panel should carry out the evaluation work based on reports from POPs waste disposal enterprise(s) and on-site investigation. The comprehensive evaluation expert panel should, based on the technical and managerial requirements for POPs waste high-temperature incineration, make comprehensive evaluation and give scores on the general conditions of the disposal enterprise(s) to be evaluated. Please refer to Annex A for relevant scoring standard and methods, and Annex B for relevant assessment contents. Then evaluation scores are sequenced. Top-ranking enterprises with higher scores will be given specific comments and suggestions on how to make disposal implementation plans and programs.

Article 23 The evaluation agency is responsible for organizing baseline monitoring work in candidate disposal units as per monitoring index and methods stipulated by existing national regulations and standards. Disposal enterprises meeting the project implementation requirements can be selected as the POPs waste disposal enterprises of the Project.

Article 24 After completing the evaluation, the evaluation agency should submit an evaluation report and other necessary documentation to FECO. The evaluation report should mainly include: the basic conditions of the enterprise evaluated, detailed evaluation implementation plan, evaluation and conclusion, statistical analysis of evaluation results, POPs waste management & disposal capability overview and main problems of the enterprise evaluated, as well as suggestions on POPs waste disposal technology and management to the enterprises evaluated.

Article 25 Within 1 month from the date the evaluation is completed, FECO should review evaluation report, confirm evaluation results and advance the POPs waste disposal work as per the schedule of the Project.

Chapter V Supplementary Provisions

Article 26 Without permission from the commissioner, the evaluation agency/personnel/experts should not provide or disclose the contents of evaluation report or documents, information and data resulting from the evaluation process to others in any way.

Article 27 Enterprise(s) taking part in evaluation should pay a certain amount of evaluation fee which is decided by FECO as per relevant regulations. The evaluation agency should not charge enterprise(s) taking

part in evaluation any other fees in any way.

Article 28 This Method is subject to implementation since its release.

Article 29 FECO is responsible for the explanation and interpretation of this Method.

Annex A Score Sheet for POPs Waste Disposal Enterprise Selection (High-temperature Incineration)

Assessment Items	Contents of Assessment	Score Value	Score
1. Basic Conditions (250 points)	1.1 Hazardous waste incineration technology, process and engineering acceptance situations	50	
	1.2 Organizational structure and staffing of the hazardous waste centralized incineration unit	50	
	1.3 Rules and regulations of the centralized incineration unit	50	
	1.4 Establishment of emergency plan for accidents	50	
	1.5 Feasibility of collection & transportation schemes of the disposal unit	50	
Subtotal		250	
2. Technical Conditions (550 points)	2.1 Hazardous waste acceptance system	50	
	2.3 Hazardous waste storage system	50	
	2.2 Hazardous waste analysis and identification system	50	
	2.3 Hazardous waste storage system	50	
	2.4 Hazardous waste incineration system	75	
	2.5 Pretreatment and feeding system	50	
	2.6 Heat energy utilization system	25	
	2.7 Flue gas purification system	75	
	2.8 Slag and fly ash handling system	25	
	2.9 Automatic control and online monitoring system	50	
2.10 Configuration and treatment requirements for pollution control facilities	100		
Subtotal		550	
3. Local Management & Basic Conditions (200 points)	4.1. Extent of pesticide POPs waste disposal recognition in the city where the disposal unit is located There should be clear management requirements for and attitudes to pesticide disposal, especially for disposal of pesticide POPs waste transferred in.	100	
	4.2. Pesticide POPs waste supervision and management conditions (including regulation system and supervision enforcement capabilities)	100	

Assessment Items	Contents of Assessment	Score Value	Score
	The environmental protection agency and industry administration should attach great importance to pesticide POPs waste supervision and management. The regulation agency should have clear supervision and management functions with corresponding enforcement capabilities.		
Subtotal		200	
Total		1000	

Note: The score value given in the sheet is the scoring range of corresponding assessment items. Experts should give a specific score for an assessment item within the scoring range based on the conformity degree of the bidding documents to the assessment contents.

Time of Assessment: _____

Assessed by: (signature) _____

Evaluation scores for POPs Waste Disposal Enterprise Selection (High-temperature Incineration)

1. Evaluation of basic operation conditions

Items	Key Points	Indicators and basis	Score
1.1 Acceptance of hazardous wastes disposal technology, process and engineering	(1) Adaptability of hazardous wastes pretreatment and incineration technology and process	Description about the adaptability of hazardous wastes pretreatment and incineration technology and process, name, model and specifications, design capacity, quantities and other technical parameters of main equipment; name, type, form and hazardous features of the wastes to be incinerated (HJ/T176)	50
	(2) System configuration	The integrity of system configuration, including pretreatment and feeding system, incinerator, heat energy utilization system, flue gas purification system, slag treatment system, automatic control and online monitoring systems and other auxiliary devices (HJ/T176)	
		The safety of system configuration; the incineration system should be in the negative pressure during operation to prevent the escape of harmful gases (HJ/T176)	
		Hazardous wastes disposal requirements, in other words, refractory materials and equipment corrosion prevention are considered or not for the disposal of hazardous waste with high content of, chlorine and other elements; for incineration system used to dispose hazardous waste with high fluorine content or with chlorine content above 5%, using the waste heat boiler to reduce temperature is prohibited, and the tail gas purification must select wet purification method (HJ/T176)	
(3) Project design and acceptance	Main auxiliary facilities, such as tools, transit and temporary storage facilities, equipment and storage facilities, equipment conditions (State Council Decree No. 408)		
1.2 Organization structure and staffing of centralized hazardous waste incineration unit	(1) Overall staffing condition	Relevant information on project design and acceptance (State Council Decree No. 408)	50
	(2) Allocation of professional technical personnel	Are appropriate production personnel, auxiliary production and management personnel allocated (State Council Decree No. 408)	
	(3) Personnel training	Are three or more technicians in environmental engineering or related majors with intermediate titles or above, and more than 3-year experience in solid wastes pollution control allocated (State Council Decree No. 408)	
		Do production and management personnel receive national and internal professional job training and meet working needs (HJ/T176)	

Items	Key Points	Indicators and basis	Score
1.3 Rules and regulations in centralized hazardous wastes incineration unit	(1) Facilities operation and management record system	(1) Hazardous wastes transfer manifest record; (2) Registration records of hazardous wastes reception; (3) Records such as identification number, sources, weight, mobilization time and demobilization time of hazardous wastes transportation vehicles to the site; (4) Records of production facilities operation process control parameters; (5) Slag disposal record for hazardous wastes incineration; (6) Equipment upgrading records; (7) Production facilities maintenance records; (8) Environmental monitoring data records; (9) Production accidents and treatment records (HJ/T176)	50
	(2) Shift system	(1) The implementation records of shift system shall be complete and standard; (2) The facilities operation and management record system mentioned above shall be implemented in the shift system (HJ/T176)	
	(3) Other systems	(1) Hazardous waste receipt and management system; (2) Hazardous waste analysis system; (3) Internal supervision and management system; (4) Facilities operating procedures; (5) Pollution control policies and measures during the operation of facilities; (6) Laboratory pollutant detection program and detailed implementation rules; (7) Facility daily operating record accounting, monitoring accounting and equipment upgrade and maintenance accounting; (8) Safe production and labor protection management systems; (9) Personnel training system; (10) Environmental monitoring system (HJ/T176)	
1.4 Preparation of emergency response plan	Emergency response plan for storage, transportation, failure of hazardous waste and insufficient disposal capacity	(1) Comprehensiveness, normativity and operability of the emergency response plan; (2) Approval of the emergency response plan from environmental protection department; (3) Fundamentals for the implementation of the emergency response plan; (4) The implementation of the emergency response plan (HJ/T176)	50

Items	Key Points	Indicators and basis	Score
1.5 Feasibility of waste disposal, collection and transportation plan	Feasibility of POPs waste collection and transportation	(1) Basic capacity in POPs waste collection and transportation; (2) POPs waste collection and transportation plan; (3) POPs waste collection and transportation risks	50

2. Evaluation of disposal facilities operation capacity

Items	Key Points	Indicators and basis	Score
2.1 Hazardous waste receiving system	(1) The implementation of hazardous waste transfer manifest system	Does centralized incineration unit go through relevant waste receiving formalities in accordance with Hazardous Waste Transfer Manifest (State Environmental Protection Administration Order No. 5)	50
	(2) Pre-inspection of hazardous waste	Does hazardous waste go through necessary pre-inspection prior to mobilization (HJ/T176)	
	(3) Special access passage for hazardous waste and the identification	(1) Is special access passage set in centralized waste incineration unit; (2) Are eye-catching warning signs and directions set (HJ/T176)	
	(4) Unloading of wastes	Are hazardous wastes after going through receiving formalities unloaded in unloading area (HJ/T176)	
2.2 Hazardous waste analysis and identification system	(1) Basic conditions for analysis and identification	Instruments for hazardous waste characteristics identification and ash monitoring and analysis (HJ/T176)	50
		Instruments for monitoring and analysis of regular indicators of sewage (HJ/T176)	
		Specifications and quantity of instruments for laboratory and its covering area (HJ/T176)	
	(2) Comprehensiveness and representation of hazardous waste identification contents	(1) Including physical properties: physical composition, volume weight, size; (2) Industrial analysis: fixed carbon, ash, volatile matter, moisture content, ash melting point and low calorific value; (3) Elemental analysis and hazardous substances content; (4) Characteristics identification (corrosively, leaching toxicity, acute toxicity and explosive nature); (5) Reactivity; (6) Compatibility (HJ/T176)	
		(3) Registration and management of waste characteristics after identification	
(4) Features identification data retention	For waste analysis and identification database, is there necessary backup and are copies saved in disc, text or other formats (HJ/T176)		

Items	Key Points	Indicators and basis	Score
	(5) Normativity of sampling and analysis	(1) Does the sampling of hazardous waste conform to Technical Specifications on Sampling and Sample Preparation from Industry Solid Waste (HJ/T20); (2) Does features analysis of hazardous waste conform to Identification Standard for Hazardous Wastes (GB5085.1~3) (HJ/T176)	
	(6) Classified management of waste	Is identified hazardous waste classified (HJ/T176)	
2.3 Hazardous waste storage system	(1) Storage container of hazardous waste	<p>Hazardous waste containers should meet national standards (GB18597)</p> <p>Containers must be corrosion and pressure resistant, sealed and not react with stored waste (GB18597)</p> <p>Containers should be in good condition and clearly marked (GB18597)</p>	50
	(2) Storage facility of hazardous waste	<p>Are there special signs in storage site of hazardous waste in line with Graphical Signs for Environmental Protection - Solid Waste Storage (Disposal) Site (GB15562.2) (GB18597)</p> <p>Are incompatible hazardous wastes stored separately, is the partition wall set to separate them (GB18597)</p> <p>Is any skirt corner built to block the leakage; surface and skirt corner are built with impermeable material, building material is compatible with hazardous waste (GB18597)</p> <p>It is equipped with leaked fluid collection device, gas outlet and gas purification devices (GB18597)</p> <p>It is equipped with safety lighting and observation windows, and emergency protection facilities (GB18597)</p> <p>It is equipped with isolation facilities, alarm devices and facilities against wind, sun, rain and fire (GB18597)</p> <p>Walls and roofs have anti-absorption functions and the site used to store liquid and semi-solid hazardous waste containers is equipped with corrosion-resistant hardened ground with no cracks on the surface (GB18597)</p> <p>Is the warehouse equipped with standby ventilation system and TV monitor (GB18597)</p>	

Items	Key Points	Indicators and basis	Score
		<p>Does the design of warehouse capacity take process operation needs and the requirements of equipment overhaul (generally 15-day interval is appropriate) and waste compatibility and incineration (GB18597)</p> <p>Is special person assigned to toxic hazardous waste storage site for 24-hour care (GB18597)</p>	
2.4 Hazardous waste incineration system	(1) Configuration of incineration facility	<p>Is secondary combustion chamber set, does the residence time of flue gas above 1,100°C in the secondary combustion chamber exceed 2s (HJ/T176)</p> <p>Does the combustion chamber have emergency emission stack at the back, and with a linkage set so that it can only be started in accident or emergency state (HJ/T176)</p> <p>Does incinerator have explosion protection door or other explosion protection facilities (HJ/T176)</p> <p>Is it equipped with the automatic control and monitoring system, showing online the operation conditions and tail gas emission parameters, and also giving feedback by itself and automatically adjusting the process parameters (HJ/T176)</p> <p>Is the incinerator in the state of negative pressure combustion during normal operation conditions (HJ/T176)</p> <p>Is incinerator equipped with emergency feeding cut-off system (HJ/T176)</p> <p>Is there weight measuring device for the waste fed into the incinerator with continuous recording (HJ/T176)</p>	75
	(2) Operating conditions during incineration	<p>Is the operation of the incineration system of hazardous waste in line with the process procedures, operating procedures and safety regulations (HJ/T176)</p> <p>Does the way of hazardous waste into the incineration system avoid direct contact of the operators with the waste (HJ/T176)</p> <p>Does the hazardous waste incineration operator operate in accordance with operating instructions, and master the disposal plan, operating instructions, incineration system process procedures, functions and location of pipelines and equipment as well as emergency response (HJ/T176)</p> <p>Does incineration system reach working parameters, is it prohibited to feed waste into the incinerator when the flue gas treatment system is not started or out of normal operation (HJ/T176)</p>	

Items	Key Points	Indicators and basis	Score
		Ensure that the incinerator is at the state of negative pressure during operation, so as to prevent the hazardous gas from escaping. (HJ/T176)	
2.5 Pretreatment and feeding system	(1) Hazardous waste pretreatment system	<p>Are hazardous wastes collocated before being fed into the incinerator according to the components and heat values so as to ensure stable incinerator operation and to reduce the loss of ignition of incineration slags (HJ/T176)</p> <p>Is mutual compatibility considered for the collocation of hazardous wastes to avoid negative effects after mixing the incompatible hazardous wastes (HJ/T176)</p> <p>Are hazardous wastes crushed and mixed appropriately before being fed into the incinerator to make the wastes mixed evenly so as to benefit the stable, safe and efficient operation of the incinerator; is appropriate dehydration adopted for the wastes of high moisture content (such as sludge and waste liquid) to reduce energy consumption (HJ/T176)</p> <p>Is it taken into consideration the property and crushing method of incineration waste, mixing of liquid waste, suction of feeding and arrangement of pipework during designing the mixing or processing system for hazardous waste (HJ/T176)</p>	50
	(2) Hazardous waste transportation, feeding equipment	<p>It adopts auto feeding device; is feed inlet configured with devices maintaining tightness to ensure stable incineration condition in the incinerator (HJ/T176)</p> <p>Are measures taken to prevent waste block during feeding to maintain smooth feeding (HJ/T176)</p> <p>Is the feeding system in the negative pressure state to prevent hazardous gas from escaping (HJ/T176)</p> <p>Are the causticity of the waste liquid and the possibility of nozzle jam by solid particles in the waste liquid considered during transmitting liquid waste (HJ/T176)</p>	
2.6 Heat energy utilization system	Configuration and operating conditions of heat energy utilization system	<p>Incineration units can consider to use the heat energy produced from incineration in an appropriate form under the condition of the emissions up to environmental standard (HJ/T176)</p> <p>Does the boiler using the heat produced from the incineration of hazardous waste take full consideration of high-temperature and low-temperature corrosion of flue gas on the boiler (HJ/T176)</p> <p>Is the temperature range of 200 - 500°C avoided for the utilization of heat produced from the incineration of hazardous waste (HJ/T176)</p>	25

Items	Key Points	Indicators and basis	Score
		Do equipment and technology in the heating system meet relevant provisions of Boiler House Design Specification (GB50041) when saturated steam or hot water is produced with heat from the incineration of hazardous waste (HJ/T176)	
2.7 Flue gas purification system	(1) Configuration of units such as quench scrubber and absorption tower of wet purification processes	(1) Is it equipped with wastewater treatment facilities to remove the hazardous substances such as heavy metal and organisms; (2) Are the measures to reduce the moisture content of the flue gas and then release it by stack taken in order to avoid the air fan with water (HJ/T176)	75
(2) Configuration of treatment units such as scrubber tower, activated carbon injection and fabric filter of semi-dry purification process	(1) Does the residence time for the flue gas in the reactor satisfy the requirement of full reaction of flue gas and neutralizer; (2) Is the temperature of the flue gas in the outlet of the reactor above 130°C to ensure that the flue gas in the follow-up pipeline and equipment won't dew (HJ/T176)		
(3) Configuration of treatment units such as dry scrubber tower or dry power feeding device, fabric filter of dry purification process	(1) Does the residence time for the flue gas in the reactor satisfy the requirement of full reaction of flue gas and agent; (2) Is the circulation of collected fly ash, reactants and unreacted agents considered. (3) Is the temperature of the flue gas in the outlet of the reactor above 130°C to ensure that the flue gas in the follow-up pipeline and equipment won't dew. (HJ/T176)		
(4) Configuration of flue gas purification system	Is priority given to bag dust remover for dust removal equipment of flue gas purification system (HJ/T176)		
Are complete wastewater treatment facilities provided if wet dust removers are selected (HJ/T176)			
Do the flue gas purification facilities have reliable measures including corrosion protection, anti-wear and fly ash block prevention (HJ/T176)			
Acidic pollutants include hydrogen chloride, hydrogen-fluoride and Sox, etc.; are appropriate alkali substances used as neutralizer for neutralization reaction in the reactor (HJ/T176)			
Is activated carbon or porous adsorbent injected between neutralization reactor and fabric filter, or is an absorption tower (bed) of activated carbon or porous adsorbents set behind the bag dust remover (HJ/T176)			

Items	Key Points	Indicators and basis	Score
		<p>Are measures considered to remove nitrogen oxides of hazardous waste with high nitrogen content; is priority given to incineration control to inhibit the production of nitrogen oxides; does the purification of nitrogen oxides in incineration flue gas use selective non-catalytic reduction (HJ/T176)</p> <p>Does the draft fan use frequency converter (HJ/T176)</p>	
	(5) Operating conditions of flue gas purification system	<p>Are the temperature, residence time and flow condition of the flue gas in the incineration chamber strictly controlled (HJ/T176)</p> <p>Is quenching treatment taken for the high-temperature flue gas from waste incineration to lower the temperature of the flue gas below 200°C within 1.0s and decrease the retention time of the flue gas in the temperature range of 200-500°C (HJ/T176)</p> <p>Are the quantity of dioxins-adsorbed activated carbon and the replacement of fabric filter within the range of design requirements.</p>	
2.8 Slag and fly ashes treatment system	<p>(1) Configuration of slag treatment system</p> <p>(2) Configuration of fly ashes treatment system</p>	<p>Does the slag treatment system include facilities for cooling, transporting, storing and crushing slag (HJ/T176)</p> <p>Does the slag treatment system keep closed (HJ/T176)</p> <p>Does the slag remover connected with the incinerator have reliable mechanical performance, and measures for ensuring the tightness in the incinerator (HJ/T176)</p> <p>Does the fly ash treatment system include facilities for fly ash collection, transporting and storing, are they closed and equipped with sealed container to prevent fly ashes from scattering (HJ/T176)</p> <p>Does the fly ashes treatment system adopt the mechanical or pneumatic ashes removal method when the flue gas purification system adopts the semi-dry method. The pneumatic ashes removal system should take measures to avoid ingress of air and prevent ashes from caking. (HJ/T176)</p> <p>Are effective dewatering measures taken when the wet method is adopted for flue gas purification (HJ/T176)</p> <p>Ashes containers should be equipped with facilities for indicating the material level, removing dust and preventing ashes from caking, and it is advisable to provide the humidifying facilities near the ashes outlet (HJ/T176)</p>	50

Items	Key Points	Indicators and basis	Score	
2.9 Automatic control and online monitoring system	(1) Automatic control system	Does centralized hazardous waste incineration have higher automatic control level, capable of realizing centralized monitoring and decentralized control of hazardous waste incineration line, heat energy utilization and auxiliary systems by decentralized control system in central control room (HJ/T176)	50	
		Does the combustion chamber have emergency emission stack at the back, and with a linkage set so that it can only be started in accident or emergency state (HJ/T176)		
		Is important information sent to central control room when local control panel is set for auxiliary facilities which do not affect overall control system (HJ/T176)		
		Are annunciator panel and digital indicator set for alarming and display of important parameters (HJ/T176)		
		Is emergency shutdown system separate from decentralized control system set (HJ/T176)		
	(2) Online monitoring system	Is site industrial television monitoring system set for warehouse storing, material transporting process and important links in the incineration line (HJ/T176)		
		Does online auto monitoring system monitor online treated flue gases, oxysulfide, nitrogen oxide, hydrogen chloride and other pollutant factors in the incineration flue gas, keep on file as required and report it to local environmental protection administration (HJ/T176)		
		Does online auto monitoring system of centralized hazardous waste incineration unit monitor online such important process indicators as oxygen, carbon monoxide, carbon dioxide, the temperature of the primary and secondary combustion chambers (HJ/T176)		
		Are the pollution control parameters and process indicators previously mentioned displayed on the site of local environmental protection administration normally (HJ/T176)		
		Is the online monitoring device possible to start simultaneously with the system operation to monitor and record and print it out as needed (HJ/T176)		
Are the displayed process parameters during incineration, such as temperature and residence time, normal (HJ/T176)				

3. Prevention control facility and disposal requirement*

Evaluation item	Evaluation points	Evaluation index and gist	scores
3.1 The emission control of air pollutants and the requirements of ambient environment air quality (GB18484)	The maximum limits of emissions of different incineration capacities (mg/m ³)	GB18484 Pollution Control Standard for Hazardous Waste Incineration	40
	(1) Lingeman blackness		
	(2) Dust		
	(3) CO		
	(4) SO ₂		
	(5) HF		
	(6) HCl		
	(7) NO _x (Calculated by NO ₂)		
	(8) Hg and its compounds (Calculated by Hg)		
	(9) Cd and its compounds (Calculated by Cd)		
	(10) As, Ni and their compounds (Calculated by As and Ni)		
	(11) Pb and its compound(Caculated by Pb)		
	(12) Cr, Ti, Sb, Cu, Ra and their compounds		
	(13) Dioxins	0.1ngTEQ/m ³	
3.2 Performance requirements of incinerator	(1) DRE	POPs waste≥99.99%; PCBs≥99.9999%	20
	(2) Clinker ignition loss	POPs waste<5%	

Evaluation item	Evaluation points	Evaluation index and gist	scores
(GB18484)	(3) Oxygen content of fuel gas in exit of incinerator	6%~10%(dry gas)	
3.3 Disposal requirement of slags and fly ash (GB18484, HJ/T176)	(1) Disposal requirement of slags	(1) Slag characteristics should be identified, after the identification, the hazardous waste should be carried out in accordance with the safe disposal of hazardous waste, or take as general waste to dispose. (2) Characteristics of slag from the incineration plant for identification, at least 1 time /day, and reserves the slag sample. The random monitoring is 1 times/month by Environmental management department	10
	(2) Disposal requirement of fly ash	Fly ash and adsorbed of PCDD/PCDF and other harmful ingredients such as carbon residue shall be conducted in accordance with hazardous waste disposal, hazardous waste landfill should be conducted	
3.4 Waste water discharge and ambient environment	Requirement of waste water discharge	Integrated Discharge Standard for Wastewater(GB8978)	10
	Environmental quality requirement of surface waste	Environmental quality standard for Surface Water(GB3838)	
3.5 environmental quality of soils	Environmental quality requirement of surrounding soils	Environmental quality standard for soils(GB15618)	10
3.6 Noise control requirement	Noise control requirement	Standard for Noise at Boundary of Industrial Enterprises (GB12348)	10
	Environmental Noise of incineration plant	Standard for Environmental Noise of Urban Area (GB3096)	

* The latest version of the revised standards of limits and management requirements should be used for relevant requirement.

High-temperature Incineration Enterprise General Management & Disposal Capability Evaluation Case Study

Take Tianjin as an Example

1. Company Overview

In 2001, Tianjin Hejia Veolia Environmental Service Co., LTD invested and operated the “Tianjin Hazardous Waste Treatment & Disposal Center” Project. The project covers an area of about 87,610 square meters with a total investment of 135 million Yuan. It is a high-tech industrialization project, the “Tianjin Industrial Toxic & Hazardous Solid Waste Incineration Technology and Equipment Industrialization Demonstration Project”, funded by treasury bonds in 1999, and one of the 20 practical things carried out by the Tianjin Government in 2001. The project introduced advanced experiences in hazardous waste treatment & disposal from developed countries around the world, as well as a complete set of modern hazardous waste treatment & disposal facilities.

Production scale of the company: hazardous waste (including medical waste) incineration capacity is 13,500 tons/year; hazardous waste solidification and safe landfill capacity is 6,200 tons/year; waste physicochemical disposal and recycling capacity is 10,000 tons/year. The establishment of the disposal center has provided the first domestic all-in-one modern hazardous waste treatment & disposal demonstration base integrating recycling, incineration and safe landfill. It is an integrated enterprise involving hazardous waste collection, transportation, treatment, disposal and recycling. It will strictly follow the waste transfer manifest system and implement the cradle-to-grave whole process hazardous waste management, thus preventing hazardous waste from polluting the environment.

In terms of the scope of hazardous waste treatment, it can handle 48 of 49 kinds of hazardous waste listed in the latest National Hazardous Waste Inventory except for HW15 explosive hazardous waste, including HW04 pesticide waste; HW10 polychlorinated (brominated) biphenyl waste; HW18 incineration residues, etc.

The disposal center can be served as a pesticide POPs waste disposal candidate enterprise for disposing waste around the center.

2. Disposal Process of the Company

The incineration workshop is responsible for waste incineration and allotment of fuel and solvent waste in fuel tank area. Through high-temperature oxidation reaction, flammable materials in hazardous waste or solid, semi-solid and liquid materials which can be pyrolyzed are ultimately turned into waste gas mainly containing carbon dioxide, water vapors and small amount of residues. The incineration system consists of material pit, feeding device, burning device, cooling device and tail gas processing device. The main burning furnace is comprised of rotary and vertical kilns. The rotary kiln uses diesel as auxiliary fuel with the working temperature ranging from 900 to 1,000 °C. After entering the vertical kiln, the flue gas will further burn up to 1,100 to 1,250 °C. Organic matters in the gas are completely decomposed, meeting the environmentally sound disposal requirement.

The physicochemical disposal plant is mainly responsible for handling all waste other than those suitable for direct incineration and landfill. Through physicochemical treatment, waste residues can meet the requirements for incineration or landfill, while waste water can meet the requirements for biological treatment by sewage treatment system, thus making the waste to become environmentally sound. Main treatment items include heavy metal mother liquor, high concentration organic mother liquor, organic and inorganic waste water/acid/alkali, toxic and hazardous chemicals, used batteries, used fluorescent lamps and so on.

The solidification workshop mainly applies stabilization treatment to the waste. Solidified waste is transferred to landfill and buried safely. The landfill occupies an area of about 47.22 mu in total. The first-stage landfill has an area of 11,442 square meters with 20-year tenure of use. The landfill mainly accepts inorganic hazardous waste from various enterprises and institutions, as well as heavy metal sludge from the physicochemical disposal workshop and residues from the incineration workshop of the company itself. The whole landfill is divided into four areas, mainly consisting of double anti-seepage system, drainage system, exhaust system, settlement monitoring system, groundwater monitoring system and covering system. Percolated sewage is pumped to the physicochemical treatment workshop for pretreatment. The medical waste workshop is mainly responsible for the handling, disinfection, cleaning and grinding of medical waste.

Two sets of internationally advanced steam sterilization and smashing equipment are imported from Germany and Canada. The high temperature steam will kill bacteria and viruses, including the SARS virus, with the disinfection and sterilization rate up to 99.9999%. The recycling workshop mainly recovers renewable resources from the waste to facilitate resource recycling.

3. Disposal Management of the Company

By following the international principles for hazardous waste collection, transportation, storage, treatment and disposal, the company can ensure that all processes are safe and will not cause secondary pollution to the environment. With the technical support from VEOLIA, a Fortune 500 company with many years of experience in hazardous waste disposal, the company has established a complete set of sound software management systems based on China's actual conditions and laws and regulations.

With reasonable administration system and stringent internal control mechanism, individual departments in the company have formed a coordinative and supervisory relationship with each other to ensure that every batch of waste coming into the plant is handled properly and no waste is lost. The internationally advanced hazardous waste analysis lab tests each batch of waste from the customer, including sampling, fingerprinting, detailed analysis and determination of waste treatment process, etc. The company also does routine environment monitoring, and reports 164 environmental monitoring indicators concerning water, gas, sound, slag, soil, etc. to the Ministry of Environmental Protection quarterly. It has set up an Environment Health & Safety Department. The establishment and implementation of various environmental security measures has ensured the safe operation of the company, improved the efficiency and accuracy of hazardous waste whole process management, achieved optimized process management, established links between individual departments, and realized waste information sharing and networking management.

Up to now, the company has disposed over 1,000 different types of hazardous waste, including 200+ tons of waste pesticides, such as Decis, Benefiter, BHC, parathion, omethoate, Benazolin, etc.; 500+ tons of highly toxic wastes such as cyanide, arsenic, etc.; 35,000+ tons of medical waste; 100,000+ tons of hazardous waste from local areas and other cities.

4. Disposal Capability Evaluation Case Study

(1) Prerequisites of the Evaluation Case Study

This section is a case study based on assumptions. According to the current distribution of pesticide POPs waste in China, the company can be taken as a potential disposal unit for disposing pesticide POPs waste in Tianjin and Hebei.

FECO has publicized a tender notice about pesticide POPs waste disposal enterprises selection to announce the distribution of waste to be disposed, the technical and management requirements for disposal technology, the requirements for disposal technology selection, financial source of the disposal and requirements for preparing application documents.

According to the requirements of the tender notice, Tianjin Hejia Veolia Environmental Service Co., LTD coordinated with the evaluation organization work and prepared application materials. The application report is focused on the basic conditions of the enterprise, the technical conditions of disposal facilities, the management capabilities of the disposal unit, project implementation plan and project related financial quotes, etc. The company ensured that the application report is authentic and accurate, and submitted them to the evaluation agency on time.

(2) Organization & Implementation of Evaluation

As the evaluation organization and implementation agency, FECO should develop technical and managerial requirements for POPs waste high-temperature incineration disposal technology, and establish methods for evaluating the general management & disposal capabilities of the POPs waste high-temperature incineration enterprise.

The evaluation agency should, based on the requirements of commission contract, organize and carry out the evaluation on POPs waste high-temperature incineration enterprise(s) independently, including: accepting evaluation application, establishing expert database, making evaluation implementation plan, drafting list of evaluation experts; organizing and carrying out communication/on-site/comprehensive evaluation and submitting evaluation report, etc.

(3) Main Contents of Evaluation

In general, the main contents of evaluation include the basic operation conditions of the disposal enterprise, the operation process of incineration facilities, the configuration and operation effect of pollution control facilities, as well as safe production and labor protection measures.

Evaluation on the basic operation conditions of the disposal enterprise should at least include: the organizational structure and staffing of the disposal enterprise and its conformity with relevant policies, regulations and standards; the application and renewal of hazardous waste operation license; the hazardous waste incineration process and engineering acceptance situations; the regulation establishment & implementation, as well as emergency plans for accidents and their implementation in the hazardous waste centralized incineration unit.

Evaluation on the management of incineration “hardware” facilities operation should at least include: hazardous waste acceptance, hazardous waste analysis and identification, hazardous waste in-plant storage and pretreatment, as well as the operation of hazardous waste incineration facilities, etc.

Evaluation on configuration and treatment effect of pollution control facilities should at least include: the incineration facility performance indicators and air pollutants emission control indicators; management and disposal of slag/fly ash from hazardous waste incineration, etc.

Evaluation on safe production and labor protection includes whether the Technical Specifications for Hazardous Waste Centralized Incineration Facilities Engineering (HJ/T176) and other state regulations related to safe production are followed.

In addition to the above technical evaluation, whether the form of the disposal application report is in compliance with relevant requirements, whether the project objectives and implementation plan are reasonable, as well as the basic qualifications and project organization & implementation capabilities of the applying enterprise should also be evaluated.

In terms of financial evaluation, whether the budget preparation process, contents and standard meet relevant requirements should be evaluated.

(3) Evaluation Procedures & Methods

The evaluation agency should, in accordance with this evaluation Method and the requirements of disposal tender documents, make detailed evaluation implementation plan and prepare necessary operational documents. The evaluation agency should select 7 to 9 experts from the expert database to carry out the evaluation work. The evaluation process includes three stages: document preparation by the disposal enterprise, on-site investigation and comprehensive evaluation.

The disposal enterprise should prepare documents closely based on the general objectives and requirements of the tender notice, and prepare the application report by considering its actual conditions.

The core purpose of on-site investigation is to investigate the general management & disposal capabilities of the enterprise by focusing on the basic operation conditions of the enterprise, the operation process of incineration facilities, the configuration and operation effect of pollution control facilities, as well as safe production and labor protection measures, so as to decide whether the technology, management, economic conditions and environmental effectiveness of the company can meet the requirements for pesticide POPs waste disposal. On-site evaluation is carried out by an expert panel, involving inspection and investigation of POPs waste disposal facilities, forums and individual interviews.

The comprehensive evaluation is carried out by the evaluation agency. The comprehensive evaluation expert panel should carry out the evaluation work based on report from the enterprise and on-site investigation. The comprehensive evaluation expert panel should, based on the technical and managerial requirements for POPs waste high-temperature incineration, make comprehensive evaluation and give scores on the general conditions of the disposal enterprise(s) to be evaluated. Please refer to Annex A for relevant scoring standard and methods, and Annex B for relevant assessment contents. Then evaluation scores are sequenced. Top-ranking enterprises with higher scores will be given specific comments and suggestions on how to make disposal implementation plans and programs.

The evaluation agency is responsible for organizing baseline monitoring work in candidate disposal units as per monitoring index and methods stipulated by existing national regulations and standards. If the enterprise meeting the project implementation requirements, then it can be selected as the POPs waste disposal enterprise of the Project.

After completing the evaluation, the evaluation agency should submit an evaluation report and other necessary documentation to FECO. The evaluation report should mainly include: the basic conditions of the enterprise evaluated, detailed evaluation implementation plan, evaluation and conclusion, statistical analysis of evaluation results, POPs waste management & disposal capabilities overview and main problems of the enterprise evaluated, and suggestions on POPs waste disposal technology and management of the enterprise.

Within 1 month from the date the evaluation is completed, FECO should review the evaluation report, confirm the evaluation results and advance the POPs waste disposal work as per the schedule of the Project.

(4) Scoring Standard of Evaluation

In this section, a comprehensive score should be given based on the application report provided by the company and Annex A and Annex B of the evaluation Method. The score is based on both technical evaluation and financial evaluation. Basic review principles and methods of UNIDO for such projects will be followed. We are not going to repeat again herein.