



RESTRUCTURING PAPER
ON A
PROPOSED PROJECT RESTRUCTURING
OF
CHINA GEF MUNICIPAL SOLID WASTE MANAGEMENT PROJECT
APPROVED ON NOVEMBER 14, 2014
TO
PEOPLE'S REPUBLIC OF CHINA

ENVIRONMENT, NATURAL RESOURCES & THE BLUE ECONOMY

EAST ASIA AND PACIFIC

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ABBREVIATIONS AND ACRONYMS

BAT	Best Available Techniques
BEP	Best Environmental Practices
FECO	Foreign Economic Cooperation Office
GEF	Global Environment Facility
MSW	Municipal solid waste
OEPA	Operations and Environmental Performance Audit
PDO	Project Development Objective



BASIC DATA

Product Information

Project ID P126832	Financing Instrument Investment Project Financing
Original EA Category Full Assessment (A)	Current EA Category Full Assessment (A)
Approval Date 14-Nov-2014	Current Closing Date 31-Dec-2019

Organizations

Borrower People's Republic of China	Responsible Agency International Economic Cooperation Office of Ministry of Ecology and Environment
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Project Development Objective (PDO)

Original PDO

The project's objective is to build capacity and demonstrate best available techniques (BAT) and best environmental practices (BEP) in municipal solid waste incineration in accordance with the Stockholm Convention.

Summary Status of Financing

Ln/Cr/Tf	Approval	Signing	Effectiveness	Closing	Net Commitment	Disbursed	Undisbursed
TF-18479	14-Nov-2014	30-Dec-2014	29-May-2015	31-Dec-2019	12.00	7.93	4.07

Policy Waiver(s)

Does this restructuring trigger the need for any policy waiver(s)?

No



I. PROJECT STATUS AND RATIONALE FOR RESTRUCTURING

A. Project Status

1. The project (US\$12 million GEF Grant) was approved on November 14, 2014, with a closing date of December 31, 2019. The project development objective (PDO) is to build capacity and demonstrate best available techniques (BAT) and best environmental practices (BEP) in municipal solid waste incineration in accordance with the Stockholm Convention. There are three components: (i) Capacity Building for Improved Operation and Regulation of MSW Incinerators; (ii) Capacity Building for Improved MSW Management Planning; and (iii) Project management. This is the first project restructuring.
2. The project has disbursed US\$7.93 million (around 66% of the total). Overall Implementation Progress is currently rated Moderately Unsatisfactory, mainly due to earlier implementation delays and the resulting inability to complete the BAT/BEP demo investments before the current closing date as explained below. Most activities are completed or about to be completed under components 2 and 3, whereas component 1 activities have experienced delays. Overall project is well advanced, and out of the project's current 11 intermediate results indicators, eight have already been achieved, some well beyond the target. Intermediate indicators not yet fulfilled relate to training, which is already ongoing.
3. While progress towards achievement of the single PDO indicator has been made, the indicator itself has not yet been achieved. The reasons for this are explained in the following paragraphs.
4. The project selected three incinerators under component 1 (Konggang, Xishan, and Dongjiao) as the chosen facilities to demonstrate the Best Available Techniques (BAT) and Best Environmental Practices (BEP) in accordance with the Stockholm Convention. The BAT/BEP demonstration proved challenging, as this approach was being tested for the first time in the country. Definition of methodologies, procurement of competent consultants and coordination with incinerators took longer than anticipated due to a variety of technical challenges. The initial step of the process was to conduct an Operations and Environmental Performance Audit (OEPA), tailored to each incinerator. The three incinerators carried out their OEPAs, including the monitoring of their baseline dioxin emissions (baseline meaning "before project interventions"), but these were completed only in 2018, more than two years behind original schedule, delaying further action.
5. Based on the OEPAs, specific improvement plans, comprising hardware, software, and operating instructions, were prepared for each of the three incinerators. These improvement plans proved challenging to implement, as they required participation of high-level experts, evaluation and approval from each incinerator, a commitment plan to carry out the investments, and their adequate implementation.
6. After the OEPA and the preparation and approval of the improvement plans, the third step would be their full implementation, followed by monitoring to evaluate the results of the improvements. Konggang and Xishan incinerators have progressed according to the plan. However, during this process, the Dongjiao incinerator showed significant deficiencies in operation and difficulties in complying with national emission standards, which led to the decision by Chinese authorities to shut it down permanently. The current situation, per incinerator, is as follows:
 - (a) **Konggang.** This is the most advanced of the three incinerators. The implementation of the improvement plan is well advanced, and is expected to be fully completed, including checks and acceptance, before December 30, 2019. However, the monitoring of its emissions, to evaluate the results of the improvements, would need to be carried out in early 2020. Once this evaluation is completed, and the improvement is certified, the Konggang incinerator would contribute to the project's achievement of the PDO indicator and sub-indicators.



- (b) **Xishan.** The implementation of the improvement plan suffered significant delays, because: (i) the plan underwent several revisions to accommodate views from different experts; (ii) its parent company then disapproved of it for technical reasons; (iii) a new plan then needed to be prepared. The new plan was finally agreed by all parties and approved in May / June 2019, and its implementation is moving quickly, with four contracts already signed in early December, two others in the negotiation stage, and a smaller one under procurement. Signature of all main contracts is expected before end of December 2019, with all BAT/BEP investments expected to be completed by May/June 2020. Monitoring of emissions would need to be carried out thereafter, and by July 2020, the Xishan incinerator would be helping the project achieve the PDO indicator and sub-indicators.
 - (c) **Dongjiao.** This incinerator has been a challenging case from the beginning, generating useful lessons throughout. During the development of the OEPA for Dongjiao, it was realized that the facility was not compliant with the emissions standards set out by Chinese regulations. Accordingly, the improvement plan was prepared, agreed and approved, with procurement set to begin. However, the Chinese government decided to shut the facility down due to non-compliance with emissions standards. For months it remained unclear if this was a temporary closure (until improvements were implemented), until, in August 2019, its permanent closure was communicated. A state-of-the-art incinerator will be built instead, for which preparations have already begun. This created significant delays to accommodate extensive negotiations, though overall serves as a positive example of good environmental management and enforcement of regulations by Chinese authorities. While the Dongjiao OEPA and improvement plan will not be implemented, as the investment was deemed not feasible, valuable lessons along the way were still collected.
7. Other project elements have been completed and are considered to be highly successful, including: allowing continuous access by regulators to the incinerators' operating conditions and emissions, public disclosure of information, improvement in the way permits are issued (now done in an integrated manner), and public engagement and awareness raising, among others. The only activities not yet completed include training (which is planned to be undertaken after having extracted lessons from the implementation of the improvement plans), and overall collection and documentation of lessons learned. Those activities are expected to be completed by end of 2020.
 8. In addition to the three incinerators, all located in Kunming (Yunnan Province), the project also supported activities in Ningbo (Zhejiang Province). All such activities have been finalized, or – in the case of those related to research about the impact of differentiated solid waste collection in incinerators' performance – are ongoing and will be extended if the closing date is also extended.
 9. Regarding environmental safeguards, the environmental performance of this project during implementation is deemed generally satisfactory according to environmental management plan's implementation reports and supervision missions. Based on the nature of the proposed restructuring, there will be no major change from the environmental perspective, and no additional adverse environmental impacts are expected. The proposed new activities trigger no new safeguards policies, and current safeguard instruments will be applied during the extended implementation period.
 10. The public engagement as part of the project activities has been implemented in a good manner and rated as satisfactory. The original project did not trigger OP/BP 4.12 (Involuntary Resettlement) and the project restructuring likewise will not involve any land acquisition or physical or economic displacement.
 11. All legal covenants have been complied with at this time. The project has no outstanding audit reports.

B. Rationale for restructuring

12. While Overall Implementation Progress is currently rated Moderately Unsatisfactory, this is mainly due to earlier implementation delays and the resulting inability to complete the BAT/BEP demonstration investments before the current closing date. The underlying project management and recent performance is satisfactory, the objectives are achievable, a timebound action plan to complete the project has been agreed (see Annex I), and closing date extension in itself would largely resolve the Overall IP rating issue by allowing time to complete all activities as well as a sufficient monitoring period to verify the BAT/BEP outcomes in the demonstration incinerators. The action plan is expected to be implemented without delays, as it focuses on additional activities to Konggang's already-approved improvement plan.



Past delays related to the preparation and approval of the improvement plan are thus not expected to be experienced again. This incinerator has demonstrated a strong implementation track record, and has already completed most of its activities under the project.

13. **Unanticipated delays.** As explained in Section A above, the technical complexity of the project generated unexpected delays due, for example, to the need to engage qualified international experts, agree on methodologies and protocols, find consensus between regulators and incinerators, import equipment from outside China, and carry out complex procurement processes. The execution and acceptance of the OEPA for each incinerator took much longer than expected. All these steps are now concluded, improvement plans are approved and ready, and no further delays are anticipated.
14. **Dongjiao closure.** In addition to the technical delays, the Chinese authorities decided to shut down the Dongjiao incinerator in August 2019, in a demonstration of determination to enforce compliance with environmental standards. Discussions and supervision efforts devoted to this sub-project throughout the shut-down period were extensive and cumbersome. This incinerator has now been removed from the project, which will allow for all efforts to be focused on implementing remaining activities.
15. **Significant progress has already been achieved.** The project has achieved most of its intermediate indicators, has generated very useful lessons and increased capacity, has had an impact at the regulatory / standards level, and is very well positioned to achieve its overall goal and become a successful demonstration of how incinerators can be improved to comply with the Stockholm Convention and thus reduce impact on global public goods. Overall the GEF outcomes remain unchanged and the focus has been on refining the output level interventions to ensure more realistic monitoring and reporting of targets.
16. **The performance of the counterpart is satisfactory;** they remain highly committed and determined to implement the project to its end. A solid plan for the remainder of project activities has been discussed with the Bank team and is being put into practice (Annex I).
17. If indicators are adjusted to reflect the project delays and other considerations, and the closing date is extended, it is expected that the project will be on track to successfully achieve all its results, and become a success and a reference in the sector.

II. DESCRIPTION OF PROPOSED CHANGES

A. *Changes to the results matrix*

18. The permanent closure of the Dongjiao incinerator means that its improvement plan will not be carried out. Therefore, by the end of the project there will be two – rather than three – demonstration incinerators for which the improvement plans will be implemented, and their baseline and end of project emission levels compared. The results matrix has thus to be revised to reflect this reduction in target numbers of demonstration incinerators. Other changes to the matrix include adjusting language to better reflect the nature of the activities. None of the end of target values for the intermediate indicators are changed. A new intermediate indicator is being introduced to capture the results of the additional activities that will be carried out with the funds that became available after the shutting down of Dongjiao, namely those related to the implementation of continuous sampling of incinerator's emissions. The detailed changes and their explanations can be seen in the new results matrix.
19. The reduction from three to two demonstration incinerators does not affect the final achievement of positive results because: (i) the Dongjiao incinerator uses the “fluidized bed incineration technology”, which is the same as the Xishan incinerator, whereas the Konggang incinerator uses the “moving grate” technology. From this perspective, BAT/BEP demonstration for the two main incineration technologies used in China will be achieved; and (ii) the Dongjiao incinerator underwent the OEPA process, and the corresponding design of its improvement plan. Kunming municipality and FECO were involved in these two steps, and extracted valuable experiences. Unanticipated, valuable lessons related to the suspension and final closure of the incinerator were also gained.



B. 15-month project extension

20. An extension is needed to enable delivery of the remaining project outcomes and outputs. The Xishan incinerator implementation plan will be completed around May/June 2020, and an additional three months would be needed to conduct final results monitoring. Other activities, such as the training of trainers, supervisors and operators, and roll-out to national level, are expected to be carried out throughout 2020. The inclusion of continuous monitoring of emissions and additional improvements to the Konggang incinerator, using the funds that were not used for Dongjiao, also recommends this technology to be tested throughout 2020. An extension of 15 months is thus proposed, to allow for sufficient time for finalization, testing, training, extraction of lessons, and closing of the project.

C. Additional activities

- 21. The funds initially allocated for implementing Dongjiao’s improvement plan, around US\$1.5 million, will now not be used for this purpose. There are an additional US\$0.5 million in savings due to exchange rate fluctuations. FECO, in consultation with the Yunnan province and incinerators, has proposed that these funds be used for two purposes: (A) installation and testing in Konggang of continuous sampling of incinerator’s emissions; and (B) additional improvements to Konggang to complement its approved improvement plan. This reallocation of funds is made at the sub-component level, and does not impact component level costs. Thus, no reallocation of funds between disbursement categories is needed, all funds will be used within category (2) as originally planned.
- 22. Activities under (A) were prioritized by FECO given their high demonstration potential. At present time, whenever the environmental controller wants to carry out an inspection of dioxin emissions at any incinerator, a manual sample of the emissions needs to be taken. This process is extremely costly, and it is not representative of the incinerator’s real emissions (a manual sample taken over a few hours, for example, will not capture the start and stop of the furnace, when dioxin emissions are typically the highest). FECO is considering the request for all incinerators, at the national level, to be equipped with continuous emission samplers, and is currently in the process of developing a national standard for this continuous sampling. Therefore, Konggang would become a national pilot that could demonstrate this technique. This would serve two purposes: (i) it would help in further assessing the results of the improvements implemented under the project, as it would provide a comprehensive picture of the emission levels of the incinerator after BAT/BEP technology; and (ii) it would further boost the demonstration aspects of the project, by piloting a method that could be extended to the national level. The implementation of these samplers would entail the purchase of hardware and software, their installation, followed by a period to test the system. Konggang is the incinerator that has agreed to installing and testing this system.
- 23. This additional monitoring technology has: (i) high demonstration potential, and ability to increase capacities at national level, which is directly linked to the PDO; (ii) little technical complications; and (iii) does not require any change in project design, project appraisal, or project environmental or social categories, as it represents only additional equipment attached to the exhaust pipelines to measure emissions.
- 24. Activities under (B) will support further investments to implement Konggang’s already-approved improvement plan, including the installation of an intelligent control of the incineration process, and a fly ash cleaning device.

III. SUMMARY OF CHANGES

	Changed	Not Changed
Results Framework	✓	
Loan Closing Date(s)	✓	



Disbursement Estimates	✓	
Implementation Schedule	✓	
Other Change(s)	✓	
Implementing Agency		✓
DDO Status		✓
Project's Development Objectives		✓
Components and Cost		✓
Cancellations Proposed		✓
Reallocation between Disbursement Categories		✓
Disbursements Arrangements		✓
Overall Risk Rating		✓
Safeguard Policies Triggered		✓
EA category		✓
Legal Covenants		✓
Institutional Arrangements		✓
Financial Management		✓
Procurement		✓
Economic and Financial Analysis		✓
Technical Analysis		✓
Social Analysis		✓
Environmental Analysis		✓

IV. DETAILED CHANGE(S)**LOAN CLOSING DATE(S)**

Ln/Cr/Tf	Status	Original Closing	Revised Closing(s)	Proposed Closing	Proposed Deadline for Withdrawal Applications
TF-18479	Effective	31-Dec-2019		31-Mar-2021	31-Jul-2021



DISBURSEMENT ESTIMATES

Change in Disbursement Estimates

Yes

Year	Current	Proposed
2015	340,000.00	0.00
2016	700,000.00	3,000,000.00
2017	2,500,000.00	1,115,931.00
2018	4,000,000.00	1,901,025.00
2019	3,650,000.00	1,364,678.00
2020	810,000.00	4,200,000.00
2021	0.00	418,366.00



Results framework

COUNTRY: China

CH GEF Municipal Solid Waste Management Project

Project Development Objectives(s)

The project’s objective is to build capacity and demonstrate best available techniques (BAT) and best environmental practices (BEP) in municipal solid waste incineration in accordance with the Stockholm Convention.

Project Development Objective Indicators by Objectives/ Outcomes

Indicator Name	DLI	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
Demonstrate BAT/BEP in municipal solid waste incineration in accordance with the Stockholm Conventio								
Regular and reliable monitoring data show operating practices that lower dioxin levels to 0.1 ng TEQ/m3 at selected demonstration incinerators (Text)		Baseline operating conditions: Xishan 72% compliance with Stockholm Convention BAT/BEP; Dongjiao 69%; Konggang 70%. Baseline dioxins emissions (ng TEQ/M3): Xishan-0.059; Dongjiao-0.46; Konggang-0.093						Operational practice targets: Xishan 90% compliance with Stockholm Convention BAT/BEP; Konggang 94%. Dioxins emission: at least meets 0.1 ng TEQ/M3.
Action: This indicator has been Revised	Rationale: <i>The Dongjiao incinerator has been permanently shut down due to non-compliance with Chinese regulations, and therefore the indicators are being adjusted to reflect this change. This shut-down does not affect the final achievement of positive results, and should be, per se, interpreted as a positive and enriching experience in the national context.</i>							



Indicator Name	DLI	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
<p><i>The Dongjiao incinerator did go through the Operations and Environmental Performance Audit process, and through the design and agreement of a program of investments for improvement. The lessons learned through this incinerator will prove to be extremely valuable in the overall context.</i></p> <p><i>This and other related indicators are to be measured before and after the improvement plan is implemented, and that is the reason why baseline and end of project targets are defined.</i></p>								
A planned schedule of improvements in operating procedures established after measuring and evaluating the baseline situation at three demonstration incinerators. (Yes/No)	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Achievement of milestones set for the improvement of operating procedures as identified in the schedule of improvements in operating procedures at selected demonstration incinerators (Text)		Operational Baselines: Xishan 72% compliance with Stockholm Convention BAT/BEP; Dongjiao 69%; Konggang 70%.						Operational practice targets: Xishan 90% compliance with Stockholm Convention BAT/BEP; Konggang 94%.
Action: This indicator has been Revised	<p>Rationale: <i>Adjusted to reflect that the Dongjiao incinerator was shut down permanently. Therefore, the milestones set for the improvement of operating procedures, which were prepared for the three incinerators, will be achieved for Konggang and Xishan, but not for Dongjiao.</i></p>							



Indicator Name	DLI	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
community bulletin boards (Yes/No)									
Dioxin emission monitoring results for five incinerators in Kunming posted on the web (Yes/No)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Action: This indicator has been Revised	<p>Rationale: <i>The word "test" was replaced with "monitoring" to more accurately reflect the reality. It has to be noted that the number of incinerators in Kunming will vary with time. The Dongjiao incinerator has been shut down, and a new one will soon be built. Before shutting down, the Dongjiao incinerator was already posting emission monitoring results on the web, together with the other incinerators, and that is the reason why the indicator is marked as achieved.</i></p>								
Operating conditions of three Ningbo incinerators posted on the web (Yes/No)	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Public awareness of incinerator information increased (Percentage)	13.70	15.00	25.00	30.00	40.00	50.00			50.00
Action: This indicator has been Revised	<p>Rationale: <i>The former indicator said that the public awareness would be "disclosed", but then the measurement was the percentage of the public with increased awareness about the incinerators. One does not disclose the public awareness, but increases it, and that's what the project was set out to do. Therefore, the indicator has been corrected, the word "disclosed" replaced by "increased". Same for the two sub-indicators that break down the indicator by gender.</i></p>								
Awareness of females of incinerator information increased (Percentage)	9.30	12.00	20.00	25.00	40.00	50.00			50.00



Indicator Name	DLI	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
Action: This indicator has been Revised	Rationale: <i>The word "disclosed" was replaced with "increased"</i>								
Awareness of males of incinerator information increased (Percentage)	18.80	18.80	30.00	35.00	40.00	50.00		50.00	
Action: This indicator has been Revised	Rationale: <i>The word "disclosed" was replaced with "increased"</i>								
Kunming district EPBs inspect each of five incinerators once per year on the basis of integrated permit (Yes/No)	No	No	No	No	Yes	Yes		Yes	
Integrated permit finalized for each incinerator (Yes/No)	No	No	No	Yes	Yes	Yes		Yes	
Number of regulators trained through study tours to northern America and Europe (Number)	0.00	0.00	18.00	18.00	36.00	36.00		36.00	
Action: This indicator has been Revised	Rationale: <i>The only adjustment to this indicator is the end of project date, adjusted to the new closing date.</i>								



Indicator Name	DLI	Baseline	Intermediate Targets						End Target	
			1	2	3	4	5	6		
Number of incinerators nationwide with at least five supervisors and operators trained in BAT/BEP (Number)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00	40.00
Action: This indicator has been Revised	Rationale: <i>Intermediate values adjusted to reflect the reality. End of project date adjusted to the new closing date.</i>									
Dioxin emissions from demonstration incinerators (Text)		Baseline to be determined at end of first year audits	Baseline		0.1 ng TEQ/m3	0.1 ng TEQ/m3	0.1 ng TEQ/m3			0.1 ng TEQ/m3
Ningbo Lab standard operating procedure assessed as consistent with international good practices (Text)		No	No	No	No	No	Yes			Yes
Number of standards revised/developed (Number)		0.00	0.00	0.00	1.00	2.00	3.00			3.00
Continuous sampling of emissions is tested in at least one selected demonstration incinerator (Yes/No)		No	No	No	No	No	Yes			Yes
Action: This indicator is New	Rationale: <i>After the closure of the Dongjiao incinerator, the resources allocated to implementing its improvement plan will instead be used for a few investments, one of the most relevant being the testing of hardware and software for continuous sampling of dioxin emissions. The current procedure to monitor the level of dioxin emissions in incinerators is through the collection of a manual sample. It is a costly procedure, subject to errors, and with results not representative of real</i>									



Indicator Name	DLI	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
<i>operation. A more comprehensive and complete picture of the situation can thus be obtained if continuous sampling of emissions is carried out. At the moment, this does not happen in China, although FECO is considering the implementation of a national standard for continuous sampling, and is studying the possibility of rolling out the sampling requirement to all incinerators. Testing the technology will not only help better evaluate the result of the improvement program on dioxin emissions, but will also yield valuable results with potential national impact. For this reason, it was deemed necessary to include an indicator to capture this important part of capacity building and demonstration.</i>									



Annex I. Action plan

The table below shows pending activities for Xishan (1 to 7) and planned new activities for Konggang (8 to 12). All of Xishan activities are in the procurement phase, with most of them already signed, two to be signed before end of December 2019, and one to be signed before end of January 2020. The procurement of Konggang activities will start once the proposed project extension is granted. One package is expected to be signed by January 2020, three by February 2020, and one more by April 2020, thus allowing for sufficient time for all new activities to be completed before the proposed new closing date of March 2021.

No.	Contract No.	Description	Cost estimate USD	Contract Signing	Expected completion
1	MSWY-33	Replacement of cloth bag for dust collector of Boiler	471,000	Signed on Nov 14, 2019	Feb 2020
2	MSWY-34	Construction and Application of Hardware Platform for Boiler Automation Combustion Algorithms	86,000	Signed on Dec 5, 2019	May 2020
3	MSWY-35	Development and Implementation of Boiler Automation Combustion Software Application System	93,000	Before end of Dec 2019	May 2020
4	MSWY-36	Upgrading of the existing DCS	99,000	Signed on Nov 4, 2019	Jun 2020
5	MSWY-37	Integration of original DCS system	87,000	Before end of Dec 2019	Feb 2020
6	MSWY-38	Replacement of pretreatment crusher for south line, upgrading the crusher for north line and maintenance of two domestic crushers	586,000	Signed on Dec 6, 2019	Feb 2020
7	MSWY-39	Research on dynamic authentication of 850 degree and 2 seconds residence in furnace and consultation of flue gas emission index control	71,000	Before end of Jan 2020	Dec 2020



8	MSWY-41	Operational Maintenance and application capacity building consultation service for online monitoring system of incineration operation in Kunming	113,000	Before end of Jan 2020	Dec 2020
9	MSWY-42	Intelligent control of incinerator combustion	775,000	By 14 Feb 2020	Nov 2020
10	MSWY-43	Upgrading and transformation of fly ash cleaning device of incineration line	571,000	By 18 Feb 2020	Nov 2020
11	MSWY-44	Dioxin continuous sampling software and hardware procurement	400,000	By 28 Feb 2020	Jun 2020
12	MSWY-45	Dioxin continuous sampling, analysis and report consultation service	50,000	By 30 Apr 2020	Dec 2020