

本署檔號
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Environmental Protection Department
Environmental Compliance Division
Regional Office (East)
5th Floor, Nan Fung Commercial Centre,
19 Lam Lok Street, Kowloon Bay,
Kowloon, Hong Kong.



環境保護署
環保法規管理科
區域辦事處(東)
香港九龍九龍灣臨樂街
十九號南豐商業中心五樓

By Registered Mail

10 October 2013

ASB Biodiesel (Hong Kong) Ltd.
Units 2607-9, 26/F, Prosperity Millennia Plaza
No. 663 King's Road
North Point, Hong Kong

Attention: Ms. Sylvia Har
Engineering Manager

Dear Sirs,

**Application for a Licence Pursuant to
Section 14 of the Air Pollution Control Ordinance**

I refer to your application received by this department on 30 November 2012 for a licence to conduct Organic Chemical Works in your premises at Chun Wang Street, Tseung Kwan O Industrial Estate, TKOTL 39, S.Q ss.1, ss2 and the Ext. thereto, Tseung Kwan O, N.T. pursuant to Section 14 of the Air Pollution Control Ordinance.

I would like to inform you that processing of your application has been completed. A licence numbered L-25-019(1) is hereby granted to you to conduct the said Works in the above premises. The effective period of the licence is 2 years commencing from 10 October 2013. The terms and conditions which you are required to observe and comply with are attached herewith in the Attachment I to the licence.

Please note that this licence is given strictly under the relevant sections of the Ordinance. It shall not affect the Director of Environmental Protection in exercising his power in future under the other provisions of the Ordinance and its subsidiary legislation, nor shall it imply consent of this Department for you to cause other forms of pollution such as noise, liquid or solid waste discharges from any activities to be conducted at the above premises.

I would also like to advise you that if you are aggrieved by the requirements of the terms and conditions fixed to this licence, you may, pursuant to section 31 of the Air Pollution Control Ordinance, appeal to the Appeal Board within 21 days after you have received this letter, in such manner and form as prescribed under the Air Pollution Control (Appeal Board) Regulations (Cap. 311, Sub. Leg.).

Yours faithfully,

(Jerry C.H. CHENG)
Environmental Protection Officer
Regional Office (East)
for Director of Environmental Protection

Encl.: Licence No. L-25-019(1)
Attachment I to the Licence
A set of stamped plans

cc. (w/o. Encl.): Cinotech Consultants Limited (Attn.: Mr. K.S. LEE)

FORM 6

[reg. 12]

**AIR POLLUTION CONTROL (SPECIFIED PROCESS) REGULATIONS
LICENCE FOR THE CONDUCT OF A SPECIFIED PROCESS**

Licence No.: L-25-019(1)

PART A (Main Licence):

Pursuant to section 15A6* of the Air Pollution Control Ordinance, the Authority grants/renews* this licence to ASB Biodiesel (Hong Kong) Ltd. to use or permit
Full Name of Licence Holder
to be used the premises at Chun Wang Street, Tseung Kwan O Industrial Estate, TKOTL 39 s.Q ss.1, ss2
Full Address of the premises at which the specified process
and the Ext. thereto, Tseung Kwan O, N.T. for the conduct of the specified process described in
is to be conducted

Part B subject to the terms and conditions described in or attached to Part C of this licence.

This licence shall be effective from the 10th day of October 20 13 and expire on the 9th day of October 20 15



..... (Jerry C.H. CHENG)
for Authority

Dated this 10th day of October 20 13

- NOTE:**
- (a) This licence consists of three parts, respectively Part A (Main Licence), Part B (Process Description) and Part C (Terms and Conditions).
 - (b) If any variation of this licence is required, the licence holder shall apply for the variation of the licence in accordance with section 18 of the Air Pollution Control Ordinance.
 - (c) Application for renewal of licence must be made not earlier than 120 days before and not later than 60 days after the date of expiry of this licence.
 - (d) A licence holder who contravenes any term or condition of this licence and who is convicted of an offence under section 30A of the Ordinance is liable to a fine of \$100,000 on conviction for a first offence and \$200,000 and imprisonment for 6 months for a second or subsequent offence and, in addition, to a daily fine of \$20,000 for a continuing offence.

* Delete if not applicable

PART B (Process Description):

Hereunder is the brief description of the process to be conducted in the premises mentioned in Part A of this licence. A more exact description of the process is contained in application of registration no.A0744..... dated the28th..... day of ...June..... 20 13.....

1. Classification of specified process: Organic Chemical Works
2. Installed/Processing* Capacity: 100,000 tonnes per annum
3. Silo Capacity (for Cement Works only): (Not Applicable)
4. Fuel Usage:

Emission Point No.	Fuel to be Used				Consumption Rate	
	Type	Ash Content	Sulphur Content	Other Specifications	Maximum	Normal
EP1	Biogas	-	≤ 0.001%	-	150 Nm ³ /h	-
EP2	Bio Heating Oil	≤ 0.06%	≤ 0.044%	-	900 kg/h	-
	Biogas	-	≤ 0.001%		80 Nm ³ /h	
	Ultra Low Sulphur Diesel	≤ 0.01%	≤ 0.005%		900 kg/h	

5. Raw materials and Products:

Type	Nature or General Composition	Raw Material Usage			Product Production		
		Consumption Rate		Annual Use (tonnes)	Production Rate		Annual Production (tonnes)
		Normal (kg/h)	Maximum (kg/h)		Normal (kg/h)	Maximum (kg/h)	
Crude Oil	Palm Fatty Acid Distillate	6,958	-	55,110	-	-	-
Crude Oil	Animal Fats	833	-	6,600	-	-	-
Crude Oil	Used Cooking Oil	2,083	-	16,500	-	-	-
Crude Oil	Grease Trap Waste	25,250	-	199,980	-	-	-
Methanol	Methanol	1,417	-	11,220	-	-	-
Mineral Acid	Sulphuric Acid	145	-	1,160	-	-	-
Mineral Acid	Phosphoric Acid	13	-	105	-	-	-
Alkaline Catalyst	Potassium Hydroxide	213	-	1,688	-	-	-
Diesel Fuel	Biodiesel	-	-	-	12,626	-	100,000
Diesel Fuel	Bio Heating Oil	-	-	-	1,125	-	8,910
Organic Material	Fertilizer	-	-	-	306	-	2,426
Polyol Compound	Crude Glycerine	-	-	-	875	-	6,930

kg/h = kilogramme per hour

6. Other Particulars:
(Nil)

* Delete if not applicable

PART C (Terms and Conditions):

The Authority grants this licence to the licence holder to use or permit to be used the premises as mentioned in Part A of this licence for the conduct of the specified process as mentioned in Part B of this licence, subject to the following terms and conditions:

(Hereunder insert the terms and conditions to be imposed to this licence-section 15(4) and 16(5) of the Air Pollution Control Ordinance)

The terms and conditions to be imposed to this licence are detailed in the Attachment I to this licence.


Attachment I

**TERMS AND CONDITIONS OF LICENCE NO. L-25-019(1)
FOR ASB BIODIESEL (HONG KONG) LTD.
TO CONDUCT AN ORGANIC CHEMICAL WORKS AT
CHUN WANG STREET, TSEUNG KWAN O INDUSTRIAL ESTATE,
TKOTL 39 S.Q SS.1, SS2 AND THE EXT. THERETO, TSEUNG KWAN O, N.T.**

(Issued as on 10 October 2013)

STANDARDS OF EMISSIONS

1. The licence holder shall, with respect to non-fugitive fixed point emissions, not emit or discharge air pollutants except from the emission points numbered EP1, EP2, EP3 and EP5, a total of 4 emission points as detailed in the following drawings approved on 10 October 2013:
 - (a) the drawing numbered EPD_APCO_SP_001 which is entitled "BLOCK PLAN";
 - (b) the drawings numbered EPD_APCO_SP_004, EPD_APCO_SP_004-1, EPD_APCO_SP_004-2, EPD_APCO_SP_004-3 and EPD_APCO_SP_004-4 which are entitled "Schematic Flow Diagram"; and
 - (c) the drawings numbered EPD_APCO_SP_005-1 and EPD_APCO_SP_005-2 which are entitled "Master Layout Plan".

ENVIRONMENTAL PROTECTION DEPARTMENT 環境保護署	
Licence No.: 牌照號碼:	L-25-019(1)
Licence Granted under Section 15 of the Air Pollution Control Ordinance 根據空氣污染管制條例第 15 條批給的牌照	
10 Oct 2013 Date 日期	 (CHENG Chi-hang) for Authority 監督(龔智恒 代行)

2. All emissions to air, other than steam or water vapour, shall be colourless, free from persistent mist or fume, and free from droplets.
3. The licence holder shall not emit or discharge air pollutants from the emission points at rates and concentrations greater than the respective emission rates and concentrations set out in the annexed Schedule A, other than as provided for in Condition 4 herein.
4. In the event of a malfunction or breakdown in the air pollution control equipment and/or the process equipment associated with the operations, the emission point(s) and/or the relevant process equipment may:
 - (a) emit or discharge air pollutants at a rate(s) and concentration(s) exceeding the corresponding rate(s) and concentration(s) specified in the annexed Schedule A; and/or
 - (b) emit visible emission,but in any case, if such emission continues for more than 5 minutes, the relevant process equipment shall be shut down immediately.
5. Smoke emitted from the emission points shall not, when compared in the appropriate manner with a Ringelmann Chart or an approved device under the Air Pollution Control (Smoke) Regulations, appear to be as dark as or darker than Shade 1 on the Ringelmann Chart or the approved device.
6. The height of emission points numbered EP1, EP2, EP3 and EP5 shall conform to that specified in the annexed Schedule B.
7. The dimension of the exit of the emission points numbered EP1, EP2, EP3 and EP5 shall conform to that specified in the annexed Schedule B.
8. The temperature and efflux velocity of the exhaust gas streams from the emission points numbered EP1, EP2, EP3 and EP5 at full load condition shall not be less than that specified in the annexed Schedule B.
9. The frequency and duration of emission of the exhaust gas streams from the emission points numbered EP1, EP2, EP3 and EP5 shall not exceed that specified in the annexed Schedule B.

FUEL, MATERIAL AND PRODUCTION CAPACITY RESTRICTION

10. All fuels to be used shall comply with the Air Pollution Control (Fuel Restriction) Regulations in force.
11. Subject to a certificate of compliance issued by a competent examiner in accordance with Regulation 4B of the Air Pollution Control (Fuel Restriction) Regulations, and compliance with other requirements of the Regulations, the licence holder may use the

production by-product, namely Bio Heating Oil (BHO) which is the restricted liquid fuel, as the fuel of the boiler served by emission point numbered EP2 in the plant.

12. Without the prior written approval by the Authority, the production of biodiesel from the plant shall not exceed 100,000 tonnes per annum.
13. The licence holder shall not use the plant to process raw materials other than that specified in the application without prior written approval by the Authority.
14. The licence holder shall inform the Authority in writing on a 3-monthly basis the following:
 - (a) the total monthly amount and the type of raw materials used for the organic chemical works; and
 - (b) the total monthly amount of biodiesel produced,of the past three months within 15 days from the end of the three months period.

CONTROL OF SOURCE EMISSIONS

15. The licence holder shall provide and maintain in good condition the condenser numbered W80200 and the scrubber numbered K80300 as detailed in the drawings numbered EPD_APCO_SP_004 and EPD_APCO_SP_004-3 to treat the chemical gases from the following equipment before emitting or discharging into atmosphere through the emission point numbered EP3:
 - (a) tanks numbered B111100, B111500, B112700, B112800, B10200, B10400, B20300, B20500, B21000, B21100, B21200, B21300, B21400, B21500, B22100, B22300, B50100, B50400, B60100, B60500, B60300 and B72300;
 - (b) flash drum numbered K40200;
 - (c) distillation columns numbered K40400 and K43000;
 - (d) decanter numbered D50600; and
 - (e) condensers numbered W112300 and W72000,as detailed in the drawings numbered EPD_APCO_SP_004 and EPD_APCO_SP_004-2.
16. The licence holder shall provide and maintain in good condition the scrubber numbered C701 as detailed in the drawings numbered EPD_APCO_SP_004 and EPD_APCO_SP_004-4 to treat the odorous gases from the following equipment before emitting or discharging into atmosphere through the emission point numbered EP5:

- (a) aeration tank numbered R301;
- (b) selection tank numbered T301; and
- (c) storage tanks numbered T1, T2, T3, T4, T5, T6, T7, T8, T9, T15, T16, T17, T18, T19, T21 and T24,

as detailed in the drawings numbered EPD_APCO_SP_004, EPD_APCO_SP_004-1, EPD_APCO_SP_004-4 and EPD_APCO_SP_005-1.

CONTROL OF FUGITIVE EMISSIONS

- 17. The licence holder shall, with respect to fugitive emissions, take all practicable measures to minimize the emission of any air pollutant from all fugitive sources including but not limited to losses or leaks from the valves, pumps, flanges and seals of the process stream, and from the storage and handling facilities of raw materials and products.
- 18. Without prejudice to the generality of Condition 17 herein, the licence holder shall keep the whole plant area, including any enclosed area or open space, free of substantially visible spillage of methanol, waste cooking oil, grease trap waste, acids, bases, biodiesel, Bio Heating Oil (BHO), glycerine or any other volatile organic compounds.
- 19. The delivery, handling, transfer and storage of methanol, waste cooking oil, grease trap waste, acids, bases, biodiesel, Bio Heating Oil (BHO), glycerine or any other volatile organic compounds shall be carried out in such a manner as to minimize the emission of chemical gases and organic vapours. Without prejudice to the generality of this condition, the licence holder shall implement the following measures:
 - (a) The above mentioned materials shall be delivered or transferred by vapour-tight pipes;
 - (b) Any drum or container containing the above mentioned materials shall be properly covered and stored;
 - (c) Any opening, including hatch, manhole or other cover on the storage tank shall not be opened except for operational needs;
 - (d) All storage tanks shall be fitted with level indication devices and alarms which are connected to the control room to monitor any leakage and spillage of the above mentioned materials. The storage tanks shall be equipped with permanent submerged fill pipes or such fill pipes so designed as to prevent splashing during filling, together with overflow prevention device, which automatically stops the filling when a predetermined level is reached;

- (e) Trays or sump pits shall be fitted to all fixed pumps handling the above mentioned materials and these trays and sump pits shall be of sufficient size to collect all leakage from the pump or spillage occurring when the pump is dismantled. These trays and sump pits shall be drained into closed tanks and shall be maintained at all times free of accumulation of leakage or spillage on them;
 - (f) All sampling points shall be provided with tundishes which are drained into a closed vessel or container;
 - (g) Sealed and drained areas shall be provided for tanker loading and unloading. Facilities shall be provided to enable any spillage be drained from such areas to an enclosed collection vessel or container;
 - (h) Bund walls shall be provided to surround the above-ground storage tanks holding organic liquids. Facilities shall be provided to enable any spillage be drained from the area within the bund walls to the pits; and
 - (i) Any drainage system for removal of organic liquids from the storage tanks shall be enclosed and contained.
20. Without prejudice to the generality of Condition 19 herein, the licence holder shall, with respect to handling of grease trap waste, discharge all incoming grease trap waste from the tanker directly to the underground storage tanks in a closed system. The grease trap waste received shall be screened to remove the food residues and other large objects. The screenings shall be stored in the containers inside the room which is maintained at a slight negative pressure in order to prevent odour emissions. All exhaust air from the room shall be diverted to on-site wastewater treatment plant as ventilation air which is finally treated by the scrubber numbered C701 as detailed in the drawings numbered EPD_APCO_SP_004 and EPD_APCO_SP_004-4 prior to discharge to the atmosphere.
21. The licence holder shall maintain all process equipment, including but not limited to pumps, seals, valves and flanges, in good condition.
22. Without prejudice to the generality of Condition 21 herein, the licence holder shall effect the control of emissions of fugitive volatile organic compounds from all process equipment with all the requirements set out in the annexed Schedule C.
23. The specifications of the instrument used for leak detection as mentioned in the annexed Schedule C and Condition 22 herein shall conform to those specified in the annexed Schedule D.
24. The results of leak detection tests conducted to fulfil the requirements of Condition 22 herein shall be retained and made accessible for inspection at all times for at least two years from the date of recording upon the request of the Authority. The record of the results shall be kept in a form substantially in accordance with that specified in the annexed Schedule E.

25. The licence holder shall submit to the Authority, within the first seven days of each month, a written summary of the result of the leak detection tests of the past month in a form substantially in accordance with that specified in the annexed Schedule F listing:-
- (a) the number and type of the process equipment being tested in the reporting month; and
 - (b) the number and type of the process equipment that are found leaking in the reporting month and when they are repaired.
26. All residues or wastes from the process shall be stored in sealed containers.
27. Except storage tanks numbered T11, T12 and T22 which contain low volatile compounds diesel oil, sulphuric acid and phosphoric acid, all storage tanks shall be fitted with pressure relief system which is connected to the control room to monitor any over pressurization. The system shall be operated such that it will automatically stop the inflow of organic liquids when the pressure reaches the relief setting pressure.

SAMPLING AND MONITORING

28. The licence holder shall provide and maintain in good condition the monitoring and recording system acceptable to the Authority at the scrubbers to monitor and record the following operating parameters of the scrubbers whenever the scrubbers are in service:
- (a) the frequency and amount of scrubber makeup;
 - (b) the frequency and amount of scrubber bleed; and
 - (c) any other operating parameters as determined from the commissioning trial of the scrubber.
29. The licence holder shall ensure the records specified in Condition 28 herein are retained and are accessible for inspection by the Authority at all times for at least two years from the date of recording.
30. The licence holder shall provide sampling points on the chimneys serving the emission points numbered EP1, EP2, EP3 and EP5. The sampling points so provided shall conform to the following specifications or any other specifications agreed by the Authority:
- (a) A safe access to the sampling point together with a platform shall be provided. The platform shall have a minimum working area of about 3 square metres;
 - (b) The internal diameter of the sampling point at the stack shall suit to the sampling probe and pitot tube;

- (c) The centre of the sampling point shall be about 1000 millimetres above the floor level of the sampling platform;
 - (d) Except with the consent of the Authority, the sampling point shall be located at least 4 stack diameters downstream of any bend, inlets, constrictions, abatement equipment, or other flow disturbance and at least 1 stack diameter upstream of the stack exit or other flow disturbances; and
 - (e) A properly grounded 15 ampere electricity supply at 220 volts shall be provided near the sampling point.
31. The licence holder shall conduct source sampling to determine the concentrations and emission rates of the air pollutants in the exhaust gas streams emitted from the emission points numbered EP1, EP2, EP3 and EP5 during their normal operations in accordance with the annexed Schedule G.
32. The licence holder shall submit to the Authority a report of the result of analysis within 30 days after the sampling as required in Condition 31 herein is completed.
33. The licence holder shall conduct odour patrol along the boundary of the plant in accordance with the annexed Schedule H.
34. Subject to Condition 11 herein, the licence holder shall conduct the following when using Bio Heating Oil (BHO) as the fuel of the boiler:
- (a) the licence holder shall test every tank load of BHO to determine the sulphur content when the fuel tank(s) is being filled or refilled. If the sulphur content so determined is greater than 346 ppm, the licence holder shall increase the proportion of ultra low sulphur diesel in the tank(s) to achieve the fuel mixture with sulphur content equal to 346 ppm or less;
 - (b) the licence holder shall conduct the test as required in Condition 34(a) herein for the first three months since the commencement of using BHO in the plant. After that the testing frequency may be reduced to one test for every two refills for the next three months, and then one test for a month thereafter; and
 - (c) in any time if there is exceedance of 346 ppm, the licence holder shall revert the testing frequency back to starting from one test for every refill, or at another frequency as agreed by the Authority.

GENERAL OPERATION AND MAINTENANCE

35. Air pollution control equipment and/or process equipment including scrubbers, level indicators, leak detection equipment, alarms, overflow prevention devices, monitoring and recording equipment for measuring and recording air pollutants, shall be maintained in good condition and put into use whenever the relevant plant is in operation.

36. Except in the event of a malfunction or breakdown of the scrubbers and/or the auxiliary equipment, the scrubbers shall be put into operation whenever any piece of equipment mentioned in Conditions 15 and 16 herein served by them is in use.
37. When there is equipment failure which may cause abnormal air pollutant emission, including but not limited to:
- (a) malfunction, breakdown or damage in air pollution control equipment and/or process equipment including scrubber, level indicator, leak detection equipment, alarm or overflow prevention device; and
 - (b) malfunction, breakdown or damage in monitoring and recording equipment for measuring and recording volatile organic compounds,

the licence holder shall take all practicable measures to minimize the quantity and duration of abnormal air pollutant emission. In any case, the licence holder shall stop operating the relevant part(s) of the plant served by the equipment within 5 minutes after the equipment failure occurs. The part(s) shall be put into operation again only when the concerned equipment has been repaired and put back to good condition.

38. With respect to a malfunction or breakdown of the air pollution control equipment and/or process equipment resulting in abnormal emission of air pollutants mentioned in Condition 37 herein, the licence holder shall:
- (a) within 2 hours if the incident occurs between 9:00 am to 5:00 pm on a working day, or before 11:00 am on the next working day if the incident occurs at any other time, notify the Authority of the following details by telephone, email or facsimile to the location(s) designated by the Authority:
 - (i) the time when the incident occurred;
 - (ii) the equipment concerned;
 - (iii) the nature of the incident;
 - (iv) the emission rate(s) and concentration(s) of the air pollutant(s) during the incident, if known;
 - (v) action that had been taken to stop the abnormal emission;
 - (vi) the time when the abnormal emission was stopped.; and
 - (b) submit to the Authority the failure record of the incident in such a form substantially in accordance with that specified in the annexed Schedule I within 3 working days of the incident.

COMISSIONING

39. The licence holder shall conduct a commissioning trial before the commercial operation of the plant. The commissioning trial shall be witnessed by the Authority.
40. The licence holder shall submit the commissioning test procedures for the determination of the emission rates of air pollutants in the exhaust gas streams emitted from the emission points numbered EP1, EP2, EP3 and EP5 under different plant operating conditions and operating parameters of the scrubbers to the Authority for approval at least one month before the commissioning trial.
41. Upon approval of the commissioning test procedures, the licence holder shall inform the Authority in writing of the schedule of the commissioning trial at least one week before conducting the commissioning trial.
42. During the commissioning trial, the licence holder shall install monitoring equipment or devices to continuously monitor the concentrations of air pollutants in the exhaust gas streams emitted from the emission points numbered EP1, EP2 and EP3 and determine their emission rates in the exhaust gas streams by measuring the exhaust gas flow rates and temperatures under the worst operation conditions in accordance with the approved test procedures. The monitoring equipment or devices shall be calibrated in accordance with manufacturers' specifications before use. The readings of monitoring equipment/devices shall be reported in parts per million by volume of the concerned air pollutants. The licence holder shall also demonstrate that the associated air pollution control equipment including leak detection equipment, overfill prevention devices, monitoring and recording equipment for measuring and recording the air pollutants are functioning. Under any operating conditions, if the emission rate of any air pollutants exceeds the corresponding limit set out in the annexed Schedule A, the licence holder shall stop operating the relevant part(s) of the plant served by the equipment within 5 minutes.
43. The licence holder shall conduct source sampling in parallel to determine the concentrations and emission rates of air pollutants in the exhaust gas streams emitted from the emission points numbered EP1, EP2, EP3 and EP5 in accordance with the annexed Schedule G.
44. The licence holder shall not use restricted liquid fuel defined under the Air Pollution Control (Fuel Restriction) Regulations to conduct the commissioning trial until such time when the quantity of the production by-product, Bio Heating Oil (BHO), suffices for full operation of the plant, during which the licence holder shall arrange testing and certification by a competent examiner in accordance with Regulation 4B of the Regulations to determine if the use of BHO for the operation of the plant complies with the specified emission limits and other requirements of the Regulations.
45. The report of the commissioning trial shall be submitted to the Authority for agreement within one month after the trial. Without prior written consent of the Authority, the licence holder shall not conduct commercial operation of the plant.

MISCELLANEOUS

46. The organic chemical works shall be constructed in accordance with the plans and specifications as detailed in the approved Drawings. Thereafter, the licence holder shall not carry out any plant variation which has an effect on the air pollutant emission from the premises, nor operate any such varied plant without the prior written approval of the Authority.
47. The licence holder shall submit an air pollution control plan in the next licence renewal application.
48. The licence holder shall comply with any provision of the Air Pollution Control Ordinance and its subsidiary regulations in force.

***** END *****

SCHEDULE A EMISSION LIMITS OF AIR POLLUTANTS

Emission Point (as in the Application)	Equipment Served by the Emission Point	Air Pollutant	Concentration of the Air Pollutant in the Exhaust Gas NOT to be Exceeded (milligramme per cubic metre)	Emission Rate NOT to be Exceeded (kilogramme per hour)
EP1	-	Nitrogen oxides ^[a]	150 ^[b]	0.053
		Carbon monoxide	50 ^[b]	0.018
		Sulphur dioxide	109 ^[b]	0.039
		Non-methane organic compounds	5 ^[b]	0.0018
EP2	-	Nitrogen oxides ^[a]	271.6 ^[b]	2.213
		Carbon monoxide	67.9 ^[b]	0.553
		Sulphur dioxide	97.78 ^[b]	0.797
		Non-methane organic compounds	5 ^[b]	0.041
		Respirable suspended particulates	13.58 ^[b]	0.111
EP3	Scrubber	Acetaldehyde	2200 ^[b]	0.0975
		Methanol	2200 ^[b]	0.0975
EP5	Scrubber	Odour	275.19 ^[c]	200.3 ^[d]

Note :

^[a] Expressed as nitrogen dioxide.

^[b] Expressed as at 0 degree Celsius temperature, 101.325 kilopascals pressure, without correction for water vapour or oxygen content. The introduction of dilution air to achieve the limit is not allowed.

^[c] Expressed as odour unit per cubic metre.

^[d] Expressed as odour unit per second.

SCHEDULE B PARTICULARS OF EMISSION OF AIR POLLUTANTS

Emission Point [as in the Application]		EP1	EP2	EP3	EP5
Equipment Served by the Emission Point		-	-	Scrubber	Scrubber
Discharge or Chimney Height (metre above Ground)		12.5	31	24.21	13.8
Cross-Section of Discharge Exit or Chimney (metre)	Width	-	-	-	-
	Length	-	-	-	-
	Diameter	0.96	0.75	0.15	1.2
Minimum Exit Temperature of Exhaust Gas at Full Load Condition (degree Celsius)		815	100	35	Ambient
Minimum Efflux Velocity of Exhaust Gas at Full Load Condition (metre per second)		0.54	7.00	0.79	0.70
Frequency and Duration of Emission	Frequency	Continuous	Continuous	Continuous	Continuous
	Duration (hour per day)	24	24	24	24
	Aggregate number of hours of emission per week	168	168	168	168

**SCHEDULE C REQUIREMENTS FOR FUGITIVE ORGANIC EMISSION
CONTROL FROM PROCESS EQUIPMENT**

1. General

- (a) Equipment that complies with the following requirements can be exempt from the instrumental leak monitoring requirements set out in this schedule:
 - (i) Equipment in vacuum service, that is, at an internal pressure at least 5 kilopascals below ambient pressure.
 - (ii) Equipment contains or contacts less than 300 hours per calendar year a fluid of organic content greater than 5 per cent.
- (b) The leak detection tests as mentioned in this schedule shall be conducted in accordance with the methods set out in the United States Environmental Protection Agency Reference Method 21 or other methods as agreed by the Authority.
- (c) The instrument used for conducting the leak detection tests as mentioned in this schedule shall conform to the specifications set out in the annexed Schedule D.
- (d) The leak definition concentrations specified in this schedule are based on the response of the instrument calibrated by methanol diluted with nitrogen or dry air. The instrument can be calibrated by another compound as agreed by the Authority if a conversion factor is determined for that alternative compound so that the resulting meter readings during source measurements can be converted to methanol results.
- (e) An equipment is in gas/vapour service if it contains a gas or vapour at operating conditions.
- (f) An equipment is in light liquid service if it contains a liquid that meets the following conditions:
 - (i) the vapour pressure of one or more of the organic constituents is greater than 0.3 kilopascals at 20 degrees Celsius;
 - (ii) the total concentration of the pure organic constituents having a vapour pressure greater than 0.3 kilopascals at 20 degrees Celsius is not less than 20 per cent by weight of the total process stream; and
 - (iii) the fluid is a liquid at operating conditions.
- (g) An equipment is in heavy liquid service if it is not in gas/vapour service or light liquid service.

**SCHEDULE C REQUIREMENTS FOR FUGITIVE ORGANIC EMISSION
CONTROL FROM PROCESS EQUIPMENT (Cont'd)**

2. Compressors

2.1 Requirements

- (a) Each compressor should be checked weekly by visual inspection for liquid dripping from the seal.
- (b) Each compressor should be monitored monthly to detect leak.
- (c) A leak is detected if:
 - (i) any indication of liquid dripping from the seal; or
 - (ii) the instrument reading exceeds 500 parts per million by volume.
- (d) When a leak is detected, the compressor concerned should be repaired as soon as practicable and in any case, should not be later than 15 calendar days after the leak is detected.

2.2 Exemption from instrumental leak monitoring

Compressors that comply with the following requirements can be exempt from the instrumental leak monitoring programme:

- (a) Compressors that are equipped with seal systems which include a barrier fluid system that satisfies the following requirements:
 - (i) The compressor seal system is operated with the barrier fluid at a pressure that is at all times greater than the compressor stuffing box pressure; or equipped with a barrier fluid degassing reservoir that is connected by a closed-vent system to a control device of efficiency greater than 95 per cent; or equipped with a closed-loop system that purges the barrier fluid directly into a process stream;
 - (ii) The barrier fluid is not in light liquid service; and
 - (iii) The barrier fluid system is equipped with a sensor, which is observed daily or equipped with an alarm, that will detect failure of the seal system and/or the barrier fluid system.
- (b) Compressors that are equipped with closed-vent system capable of capturing and transporting any leakage from the seal to a control device of efficiency greater than 95 per cent.

**SCHEDULE C REQUIREMENTS FOR FUGITIVE ORGANIC EMISSION
CONTROL FROM PROCESS EQUIPMENT (Cont'd)**

3. Pumps in Light Liquid Service

3.1 Requirements

- (a) Each pump shall be checked weekly by visual inspection for liquid dripping from the seal.
- (b) Each pump shall be monitored monthly to detect leak.
- (c) A leak is detected if:
 - (i) any indication of liquid dripping from the seal; or
 - (ii) the instrument reading exceeds 1,000 parts per million by volume for pumps handling methanol or other light liquid.
- (d) When a leak is detected, the pump concerned shall be repaired as soon as practicable and in any case, shall not be later than 15 calendar days after the leak is detected.
- (e) A quality improvement programme shall be implemented if calculated on a six-month rolling average, more than 10 per cent of the pumps or more than three pumps leak.

3.2 Exemption from instrumental leak monitoring

Pumps that comply with the following requirements can be exempt from the instrumental leak monitoring programme:

- (a) Pumps that are equipped with dual mechanical seals which include a barrier fluid system that satisfies the following requirements:
 - (i) the barrier fluid system is operated with the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure; or equipped with a barrier fluid degassing reservoir that is connected by a closed-vent system to a control device of efficiency greater than 95 per cent; or equipped with a closed-loop system that purges the barrier fluid into a process stream;
 - (ii) the barrier fluid is not in light liquid service; and
 - (iii) the barrier fluid system is equipped with a sensor, which shall be observed daily or equipped with an alarm, that will detect failure of the seal system and/or the barrier fluid system.

**SCHEDULE C REQUIREMENTS FOR FUGITIVE ORGANIC EMISSION
CONTROL FROM PROCESS EQUIPMENT (Cont'd)**

- (b) Pumps without externally actuated shaft penetrating the pump housing.

4. Valves in Gas/Vapour Service and in Light Liquid Service

4.1 Requirements

- (a) Each valve shall be monitored for leak at frequencies specified below:
 - (i) monthly if the percentage of leaking valves calculated on a monthly rolling basis is greater than 2 per cent;
 - (ii) quarterly if the percentage of leaking valves calculated on a monthly rolling basis is greater than 1 per cent but less than 2 per cent;
 - (iii) semiannually if the percentage of leaking valves calculated on a monthly rolling basis is greater than 0.5 per cent but less than 1 per cent;
 - (iv) annually if the percentage of leaking valves calculated on a monthly rolling basis is less than 0.5 per cent; and
 - (v) annually if the valve cannot be monitored without elevating the monitoring personnel more than two metres above a support surface.
- (b) A leak is detected if the instrument reading exceeds 500 parts per million by volume.
- (c) When a leak is detected, the valve concerned shall be repaired as soon as practicable and shall not be later than 15 calendar days after the leak is detected unless a plant shutdown is necessary. In that case, the repair shall be carried out in the next scheduled plant shutdown.

4.2 Exemption from instrumental leak monitoring

- (a) Valves that are unsafe to monitor can be exempt from the instrumental leak monitoring programme but shall be monitored as frequent as practicable during safe-to-monitor times.
- (b) Valves that are operated at a frequency less than once per week can alternatively be monitored for leak at frequencies specified in Section 5 herein in this Schedule.

**SCHEDULE C REQUIREMENTS FOR FUGITIVE ORGANIC EMISSION
CONTROL FROM PROCESS EQUIPMENT (Cont'd)**

5. Connectors in Gas/Vapour Service and in Light Liquid Service

5.1 Requirements

- (a) Each connector shall be monitored for leak at frequencies specified below:
 - (i) annually if the percentage of leaking connectors found from initial checking is greater than 0.5 per cent or if the percentage of leaking connectors found from quadrennial checking is greater than 1 per cent;
 - (ii) biennially if the percentage of leaking connectors found from initial checking is less than 0.5 per cent or if the percentage of leaking connectors found from quadrennial checking is greater than 0.5 per cent but less than 1 per cent; and
 - (iii) quadrennially if the percentage of leaking connectors found from biennial checking is less than 0.5 per cent.
- (b) A leak is detected if an instrument reading exceeds 500 parts per million by volume.
- (c) When a leak is detected, the connector concerned shall be repaired as soon as practicable and shall not be later than 15 calendar days after the leak is detected unless a plant shutdown is necessary. In that case, the repair shall be carried out in the next scheduled plant shutdown.

5.2 Exemption from instrumental leak monitoring

Connectors that comply with the following requirements can be exempt from the instrumental leak monitoring programme:

- (a) Inaccessible connectors that are either:
 - (i) buried;
 - (ii) insulated in a manner that prevents access to the connector by a monitor probe;
 - (iii) obstructed by equipment or piping that prevent access to the connector by a monitor probe; or
 - (iv) unable to be reached from a 7.6-metre portable scaffold on the ground, and is more than two metres above a support surface.

**SCHEDULE C REQUIREMENTS FOR FUGITIVE ORGANIC EMISSION
CONTROL FROM PROCESS EQUIPMENT (Cont'd)**

- (b) Glass or glass-lined connectors.
- (c) Screwed connectors of 50.8 millimetres or less but they shall be monitored for leaks if:
 - (i) evidence of a potential leak is found; or
 - (ii) within the first three months after being returned to organic service after having been opened or have the seal broken.

6. Pressure Relief Devices in Gas/Vapour Service

6.1 Requirements

- (a) No emission of volatile organic compounds should be released from any relief device to the atmosphere below the design safety release pressure of the device. Except during pressure release, each pressure relief device in gas/vapour service should be operated without leaks, that is, with an instrument reading of less than 500 parts per million by volume.
- (b) When a leak is detected, the pressure relief device concerned should be repaired as soon as practicable but in any case, should not be later than 15 calendar days after the leak is detected.
- (c) After each pressure release, the pressure relief device concerned should be returned to the condition indicated by an instrument reading of less than 500 parts per million by volume as soon as practicable and in any case, should not be later than 5 calendar days after the pressure release.

7. Pumps, Valves, Connectors and Reactors in Heavy Liquid Service

7.1 Requirements

- (a) Pumps, valves, connectors and reactors in heavy liquid service shall be monitored for leak within 5 calendar days if evidence of a potential leak is found.
- (b) A leak is defined if the instrument reading exceeds:
 - (i) 2,000 parts per million by volume for pumps;

**SCHEDULE C REQUIREMENTS FOR FUGITIVE ORGANIC EMISSION
CONTROL FROM PROCESS EQUIPMENT (Cont'd)**

- (ii) 500 parts per million by volume for valves, connectors and pressure relief devices; and
 - (iii) 10,000 parts per million by volume for reactors.
- (c) When a leak is detected, the equipment concerned shall be repaired as soon as practicable and shall not be later than 15 calendar days after the leak is detected unless a plant shutdown is necessary. In that case, the repair shall be carried out in the next scheduled plant shutdown.

**SCHEDULE D PERFORMANCE SPECIFICATIONS FOR THE INSTRUMENT
FOR LEAK DETECTION**

1. Definitions

- (a) "Response Factor" means the ratio of the known concentration of a volatile organic compound to the observed meter reading when measured using an instrument calibrated with the specified reference compound.
- (b) "Response Time" means the time interval from a step change in volatile organic compound concentration at the input of the sampling system to the time at which 90 per cent of the corresponding final value is reached as displayed on the instrument readout meter.
- (c) "Calibration Precision" means the degree of agreement between measurements of the same known value, expressed as the relative percentage of the average difference between the meter readings and the known concentration to the known concentration.

2. Performance Specifications

<u>Parameter</u>	<u>Specification</u>
(a) Response factor	Less than 10 unless correction curve is used.
(b) Response time	Less than 30 seconds.
(c) Calibration precision	Less than or equal to 10 per cent of the calibration gas value.

3. Additional Requirements

- (a) The instrument shall respond to the compounds being processed, which is determined by the response factor.
- (b) The instrument shall be capable of measuring the leak definition as specified.
- (c) The scale of the instrument shall be readable to ± 5 per cent of the specified leak definition concentration.
- (d) The instrument shall be equipped with a pump so that a continuous sample is provided at a nominal flow rate of between 0.0005 and 0.003 cubic metres per minute.
- (e) The instrument shall be intrinsically safe for operation in explosive atmospheres.

SCHEDULE F MONTHLY SUMMARY OF LEAK DETECTION TEST RESULT

Monthly Summary of Leak Detection Test Result

Month: _____

Year: _____

Type of Equipment	Total Number of Components Tested	Number of Leaky Components Found	Date of Completion of Repair Work
Pumps			
Valves (High Frequency)			
Valves (Low Frequency)			
Valves (Not Easily Accessible)			
Connectors			

Person in-charge: _____

Signature: _____

Date: _____

SCHEDULE G SAMPLING AND MEASUREMENT REQUIREMENTS

General Requirements

1. The licence holder shall conduct source sampling to determine the concentrations and emission rates of the air pollutants in the exhaust gas streams emitted from the emission points numbered EP1, EP2, EP3 and EP5 during their normal operations.
2. Source sampling and subsequent laboratory analysis shall only be carried out by laboratory accredited under HOKLAS or others as agreed by the Authority.
3. The licence holder shall inform the Authority in writing of the schedule of the sampling at least one week before it is carried out.

Sampling Frequency

4. The licence holder shall conduct source sampling at the frequency set out in the following table. Additional sampling shall be conducted upon the request by the Authority.

Air Pollutant	Sampling Frequency	Number of Sample Required
Nitrogen oxides Carbon monoxide Sulphur dioxide Respirable suspended particulates Non-methane organic compound Acetaldehyde Methanol	Once per month for the first 12 months of operation. Once for every half year if all results in the first 12 months complied with the emission limits set out in the annexed Schedule A.	Two samples for each parameter for each emission point
Odour	Once per month for the first 24 months of operation. Once for every half year if all results in the first 24 months complied with the emission limit set out in the annexed Schedule A.	

SCHEDULE G SAMPLING AND MEASUREMENT REQUIREMENTS (Cont'd)

5. The licence holder shall also measure the exhaust gas temperatures and velocities during the measurement of the pollutants.

Test Method

6. Unless otherwise approved by the Authority in writing, the licence holder shall use the following test methods to conduct the sample analysis and measurement.

Measured Parameter	Test Method
Nitrogen oxides	USEPA Method 7
Carbon monoxide	USEPA Method 10B
Sulphur dioxide	USEPA Method 3
Respirable suspended particulates	USEPA Method 5
Non-methane organic compounds	USEPA Method TO-14
Acetaldehyde	USEPA Method TO-14
Methanol	USEPA Method TO-14
Odour	EN 13725
Exhaust gas temperature	USEPA 40 CFR Part 60
Exhaust gas velocity / flow rate	USEPA Method 2D

SCHEDULE H ODOUR PATROL REQUIREMENTS

- The licence holder shall carry out odour patrol to monitor the odour intensity along the boundary of the plant at the frequency set out in the following table. Additional monitoring shall be conducted upon the request by the Authority. The patrol shall be conducted by the trained personnel or competent person who should have a specific sensitivity to a reference odour (i.e. on reference materials n-butanol with the concentration of 50 parts per million in nitrogen (v/v)).

Frequency	Parameter
Two times a day, one in the morning and one in the afternoon	Odour Intensity (see 2)
<ul style="list-style-type: none"> Monthly for the first 12 months of operation. If the limit level is not triggered during the first year of operation, the monitoring frequency shall be reduced to quarterly intervals in the subsequent years of operation; and 	
<ul style="list-style-type: none"> If the action level is triggered in any time since then, the frequency shall be resumed to monthly intervals until compliance with the action level for three consecutive months is obtained and the frequency will be reduced to quarterly intervals thereafter. 	

- The odour intensity during the patrol is categorized below:

Class	Odour Intensity	Description
0	Not Detected	No odour perceived or an odour so weak that it cannot be easily characterized or described
1	Slight	Identified odour, slight
2	Moderate	Identified odour, moderate
3	Strong	Identified odour, strong
4	Extreme	Severe odour

- The action and limit levels are summarized below:

Action Level	Limit Level
Odour intensity \geq Class 2 or One documented complaint received	Odour intensity \geq Class 3 recorded on 2 consecutive patrols

4. When a complaint is received regarding odour nuisance, the licence holder shall submit a complaint log to the Authority within 24 hours by email or facsimile to the location(s) designated by the Authority. The form should include but not be limited to the following:
- (i) Date and time of the complaint;
 - (ii) Name and contact information of the complainant;
 - (iii) Location of where the odour nuisance occurred;
 - (iv) Characteristics of the odour;
 - (v) Odour strength;
 - (vi) Meteorological conditions including temperature, wind speed, wind direction, relative humidity obtained from the Tseung Kwan O Weather Station of the Hong Kong Observatory at the time of the complaint; and
 - (vii) Operation activities carried out at the plant at the time the nuisance occurred.

SCHEDULE I EQUIPMENT FAILURE RECORD

To: The Authority

Notice is hereby given that during the period of _____ to _____, an equipment failure which may cause abnormal air pollutant emission has occurred. Details of the specified process and the incident are as follows:

1. Name and address of the premises where the specified process is conducted:
2. Licence No.:
3. Date and time of the incident:
4. Equipment concerned:
5. Emission point(s) concerned (if applicable):
6. Production/processing rate during the incident:
7. Nature of equipment failure :
8. Emission rate(s) and concentration(s) of air pollutant(s) during the incident, if known:
9. Actions taken to stop the emission after the equipment failure:
10. Actions taken to prevent similar incident from occurring again:
11. Name and contact telephone no. of the person in charge:

I certify that the above statements are correct to the best of my knowledge and belief.

Signature: _____

Name: _____

Position: _____

Date: _____