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*for a sustainable future*

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23528

UNIDO PROJECT Number MP/ROM/ 07/ 003  
CONTRACT No. 16001077  
THIRD TRANCHE  
Amendment No.3 ( Request of Proposal No.16001485)

## FINAL REPORT

Final Report refers to the activities related to Contract 16001077, Third Tranche, Amendment No.3 , Request of Proposal No.16001485 - UNIDO Project Number MP / ROM / 07 / 003 performed during August - December 2007.

### **A. Summary of activities**

1. Preparation of documents and questionnaires for technical – economical audit , in August 2007;
2. Performing technical – economical audit in September 2007;
3. Elaboration and submittance of the Proposal regarding Amendment No. 2 to Contract 16001077 in September 2007;
4. Signing of the Amendment No.2. to Contract – Third Tranche – by both parties in October 2007;
5. Acceptance of eighth payment ( 40000 USD for 2006 ) in September 2007;
6. Elaboration and submittance of the Proposal regarding Amendment No. 3 to Contract 16001077 in October 2007;

7. Signing of the Amendment No.3. to Contract – Third Tranche – by both parties in November 2007;
8. Acceptance of ninth payment ( 30000 USD for 2006 ) in October 2007;
9. Submittance of Draft Final Report , Amendment No.3 , Request of Proposal No.16001485
10. Acceptance of tenth payment ( 5000 USD) in November 2007
11. Submittance of Final Report in December 2007.

## **B. Description of main activities**

1. Cumulative data regarding unintended CTC production, stocks, ratios and incineration of CTC mixture – see table no. 1 :

Table No. 1. Data refers to period August - December 2007

MONTH	AUGUST	SEPTEMBER	October	November	December
	2007	2007	2007	2007	2007
Methylene chloride production ( to )	--	--	--	--	--
Chloroform production ( to )	50	--	--	--	--
CTC production ( to )	11	--	--	--	--
CTC mixture processed ( destroyed) by incineration (to)	--	--	--	34	--
CTC stock ( to )	546	546	546	512	512
Ratio CH <sub>2</sub> Cl <sub>2</sub> / CTC	--	--	--	--	--
Ratio CHCl <sub>3</sub> / CTC	4.54	--	--	--	--
Ratio ( CH <sub>2</sub> Cl <sub>2</sub> + CHCl <sub>3</sub> ) / CTC	4.54	--	--	--	--

- Production plant stopped during August – December due to low prices on chloromethane market;
- Chloroform / CTC production in August due to processing of intermediate mixture left from July. CTC mixture produced in August was stored in vessel V74/4.

## 2. Monitoring , reporting and registration of CTC emissions

The activities related to the subject were performed during the period covered by report.

Control schedule and corresponding registration sheet are annexed (Annex 1 and 2 ).

During and after the start – up of incineration unit , the control area was extended also to include the location of incineration plant.

No values of CTC emissions greater than the detection limit of the analyzer ( 5 ppm) were found during the whole control period.

## 3. Acquisition, erection and start – up of incineration plant

The erection of incinerator unit was completed during September – November 2007. Commissioning and preliminary tests were performed under supervision of Licensor's technical team, in the first half of November. The start - up of the incinerator unit was performed in 16 November under the supervision of Licensor's technical team.

The incineration plant runs satisfactorily and until now it was incinerated the quantity of 34 tons CTC mixture.

A protocol was signed between representatives of Licensor ( Michaelis ) and Chimcomplex, regarding the postponing of performance ( guarantee ) test for the incinerator unit. The protocol is annexed ( Annex 3).

In December the incinerator unit was stopped for activities related to preparation of performance test , planned for first half of January 2008.

During the start – up of the unit, the Licensor – Michaelis Germany – identified several possibilities of plant operation improvement which are

implemented now and will become operational during planned performance test.

#### 4. Planning and execution of the demolition of existing plant for production of chlorinated methane.

##### 4.1. Preliminary activities

- establishing an environmental clean - up team and its organizational structure ( team leadership )
- establishing concrete tasks and timeframe for team activities and attribution( competence ) of team leader.
- according to specific tasks and timeframe, the team leader will issue and submit for approval an Environmental Closure Plan.
- performing acquisition of specific materials, devices and equipments needed for execution of Environmental Closure Plan ( non-routine activities).

##### 4.2. Definitive Shut Down of production process

Definitive Shut Down of the plant will be performed in a controlled manner according to existing operating instructions in order to insure optimal safety conditions for personnel and environment thus:

- chlorination and absorption units will be stopped according to operating instruction IL – 349 – 002 – ed. in Force: Shut Down for Revision.
- neutralization unit will be stopped according to operating instruction IL – 349 – 003 – ed. in Force: Shut Down for Revision.
- drying and condensing units will be stopped according to operating instruction IL – 349 – 004 – ed. in Force: Shut Down for Revision.
- rectification unit will be stopped according to operating instruction IL – 349 – ed. in Force: Shut Down for Revision.
- refrigeration unit will be stopped according to operating instruction IL – 349 – ed. in Force: Shut Down for Revision.

#### 4.3. Emptying of production line, products destination

- all existing final products ( methylene chloride, chloroform ) in intermediate storage tanks will be analyzed and, if conforming to quality specification, will be sent to the final storage to be dispatched to the clients.
- off specification products , inventories of equipments in the production line ( separators, rectification columns, vessels ) together with residual product containing CTC will be transferred to a railroad wagon and sent to the incineration unit.
- products inventories of process lines will be flushed with nitrogen and sent to the same railroad wagon for final incineration.
- cooling brine inventory ( calcium chloride solution 10 – 15% ) will be transferred to a railroad wagon for recovery and reuse.
- caustic soda lye ( 10% ) inventory will be transferred to bulk containers to be used for waste water treatment in factory own facility.
- ammonia inventory of refrigeration system will be transferred to a railroad wagon to be reused inside factory.

#### 4.4. Decontamination of plant equipments and disposal of materials

As a general rule, all equipments containing internals ( packings, trays ) will be decontaminated by steaming; condensates will be stored and decanted chlorinated organics will be separated and sent to incineration unit.

Ceramic packing rings containing carbon-black deposits, after steaming, cooling and checking of needed decontamination level ( by portable analyzer ) will be packed in plastic big-bags and disposed to waste solid dump area of the factory.

Heat insulation materials will be also packed in plastic big-bags and disposed to the same waste dump area.

Detailed procedures and operations related to the decontamination, control of decontamination and disposal of materials will be covered by Environmental Closure Plan.

#### 4.5. Dismantling of equipments, final decontamination of plant area

Detailed planning and procedures for equipments dismantling, storage of dismantled equipments, pipes, fittings, materials, control of emissions during dismantling activities and final decontamination of plant area will be covered in details by Environmental Closure Plan.

Equipments and materials as resulted from dismantling activities will be capitalized as they are or by further dismantling as components according to the Procedure in Force for such activities ( separately for carbon steel, stainless steel, graphite, cables, etc. ).

#### 5. Planning and execution the introduction of a new plant with a chemical process to generate low amounts of CTC

No final decision was taken by superior management regarding the new chlorometane plant investment because of the very low prices on chloromethane market in the last months ( August – December ).

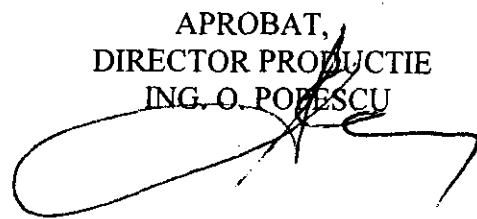
#### Project team:

Eng. Popescu Octavian .....  
Eng. Manole Ștefania .....  
Eng. Levițchi Eugenia .....  
Eng. Coman Dumitru .....  
Ec. Munteanu Gina .....  
Eng. Făgărășan Gheorghe .....  
Eng. Olteanu Lucia .....



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SECTIA PRODUSE ORGANICE

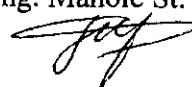
APROBAT,  
DIRECTOR PRODUCTIE  
ING. O. POPESCU



GRAFIC DE CONTROL AL EMISIILOR DIFUZE DE CCl<sub>4</sub>  
-AUGUST 2007-

Nr. Crt.	Data	Poz. Rez./ Nr. cist.	Nr. Crt.	Data	Poz. Rez./Nr. cist.
1.	01.08.	B75/4; V74/4 / 6436	13.	17.08.	B75/4; V74/4 / 3133
2.	02.08.	B75/4; V74/4 / 2528	14.	20.08.	B75/4; V74/4 / 0414
3.	03.08.	B75/4; V74/4 / 1884	15.	21.08.	B75/4; V74/4 / 6436
4.	06.08.	B75/4; V74/4 / 1668	16.	22.08.	B75/4; V74/4 / 2528
5.	07.08.	B75/4; V74/4 / 3415	17.	23.08.	B75/4; V74/4 / 1884
6.	08.08.	B75/4; V74/4 / 9172	18.	24.08.	B75/4; V74/4 / 1668
7.	09.08.	B75/4; V74/4 / 1660	19.	27.08.	B75/4; V74/4 / 3415
8.	10.08.	B75/4; V74/4 / 1165	20.	28.08.	B75/4; V74/4 / 9172
9.	13.08.	B75/4; V74/4 / 3441	21.	29.08.	B75/4; V74/4 / 1660
10.	14.08.	B75/4; V74/4 / 9141	22.	30.08.	B75/4; V74/4 / 1165
11.	15.08.	B75/4; V74/4 / 0406	23.	31.08.	B75/4; V74/4 / 3441
12.	16.08.	B75/4; V74/4 / V 435			

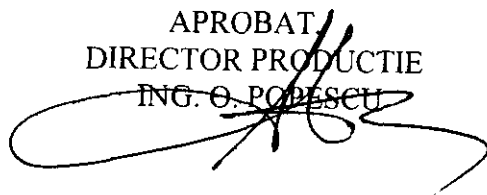
Intocmit,  
Ing. Manole St.



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SECTIA PRODUSE ORGANICE

PO951/31.08.07


APROBAT  
DIRECTOR PRODUCTIE  
ING. O. POPESCU



GRAFIC DE CONTROL AL EMISIILOR DIFUZE DE CCl<sub>4</sub>  
-SEPTEMBRIE 2007-

Nr. Crt.	Data	Poz. Rez./ Nr. cist.	Nr. Crt.	Data	Poz. Rez./Nr. cist.
1.	03.09	V74/4 / 9141	12.	18.09	V74/4 / 1660
2.	04.09	V74/4 / 0406	13.	19.09	V74/4 / 1165
3.	05.09	V74/4 / V435	14.	20.09	V74/4 / 3441
4.	06.09	V74/4 / 3133	15.	21.09	V74/4 / 9141
5.	07.09	V74/4 / 0414	16.	24.09	V74/4 / 0406
6.	10.09	V74/4 / 6436	17.	25.09	V74/4 / V435
7.	11.09	V74/4 / 2528	18.	26.09	V74/4 / 3133
8.	12.09	V74/4 / 1884	19.	27.09	V74/4 / 0414
9.	13.09	V74/4 / 1668	20.	28.09	V74/4 / 6436
10.	14.09	V74/4 / 3415			
11.	17.09	V74/4 / 9172			

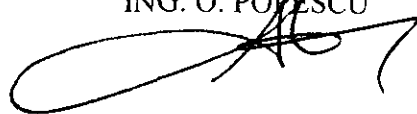
Intocmit,  
Ing. Manole St.

 / 30.08.07

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PO 1037/09.10.07.

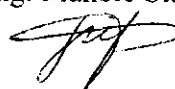
APROBAT  
DIRECTOR PRODUCTIE  
ING. O. POPESCU



GRAFIC DE CONTROL AL EMISIILOR DIFUZE DE CCl<sub>4</sub>  
-OCTOMBRIE 2007-

Nr. Crt.	Data	Poz. Rez./Nr. cist.	Nr. Crt.	Data	Poz. Rez./Nr. cist.
1.	01.10	2528	13.	17.10	0414
2.	02.10	1884	14.	18.10	6436
3.	03.10	1668	15.	19.10	V74/4
4.	04.10	3415	16.	22.10	2528
5.	05.10	9172	17.	23.10	1884
6.	08.10	1660	18.	24.10	1668
7.	09.10	1165	19.	25.10	3415
8.	10.10	3441	20.	26.10	9172
9.	11.10	9141	21.	29.10	1660
10.	12.10	0406	22.	30.10	1165
11.	15.10	V435	23.	31.10	3441
12.	16.10	3133			

Intocmit,  
Ing. Manole St.

 / 09.10.07.

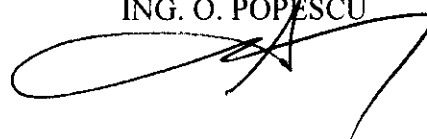
DEPARTAMENT PRODUCTIE  
SECTIA PRODUSE ORGANICE

PO1154/30.10.07

11832/30.10.'07

DP1049/30.10.2007


APROBAT,  
DIRECTOR PRODUCTIE  
ING. O. POPESCU



GRAFIC DE CONTROL AL EMISIILOR DIFUZE DE CCl<sub>4</sub>  
-NOIEMBRIE 2007-

Nr. Crt.	Data	Poz. Rez./ Nr. cist.	Nr. Crt.	Data	Poz. Rez./Nr. cist.
1.	01.11	9141	13.	19.11	1660
2.	02.11	0406	14.	20.11	1165
3.	05.11	V435	15.	21.11	3441
4.	06.11	3133	16.	22.11	9141
5.	07.11	0414	17.	23.11	0406
6.	08.11	6436	18.	26.11	V435
7.	09.11	V74/4	19.	27.11	3133
8.	12.11	2528	20.	28.11	0414
9.	13.11	1884	21.	29.11	6436
10.	14.11	1668	22.	30.11	V74/4
11.	15.11	3415			
12.	16.11	9172			

Intocmit,  
Ing. Manole St.

 / 30.10.07.

ANEX 1

DEPARTAMENT PRODUCTIE  
SECTIA PRODUSE ORGANICE

PO 1203/30.11.07


11987/30.11.07

APROBAT  
DIRECTOR PRODUCTIE  
ING. O. POPESCU

GRAFIC DE CONTROL AL EMISIILOR DIFUZE DE CCl<sub>4</sub>  
-DECEMBRIE 2007-

Nr. Crt.	Data	Poz. Rez./ Nr. cist.	Nr. Crt.	Data	Poz. Rez./Nr. cist.
1.	03.12	V01	11.	17.12	V01
2.	04.12	2528	12.	18.12	1165
3.	05.12	1884	13.	19.12	3441
4.	06.12	V01	14.	20.12	V01
5.	07.12	1668	15.	21.12	9141
6.	10.12	V01	16.	24.12	V01
7.	11.12	3415	17.	27.12	V01
8.	12.12	9172	18.	28.12	0406
9.	13.12	V01	19.	31.12	V01
10.	14.12	1660			

Intocmit,  
Ing. Manole St.

 /30.11.07.

*V. R. P.*  
VALOARE  
DETERMINATA

NR CRT	DATA	POZ REZ NR CIST	EMISII CCLY	CM	VALOARE DETERMINATA
40	26.07.2007	B75/4 V74/4 cist 0406	NU NU NU		
41	27-07-2007	B75/4 V74/4 VAS 435	HU NU NU		
42	30.07.2007	B75/4 V74/4 cist 3133	NU NU NU		
43	31.07.2007	B75/4 V74/4 cist 0414	NU NU NU		
LUNA AUGUST 2007					
44	01.08.2007	B75/4 V74/4 cist 6436	NU NU NU		<i>V. R. P.</i>
45	02.08.2007	B75/4 V74/4 cist 2528	NU NU NU		
46	3-08-2007	B75/4 V74/4 cist 1884	NU NU NU		
47	6.08.2007	B75/4 V74/4 cist 1668	NU NU NU		
48	7.08.2007	B75/4 V74/4 cist 3415	NU NU NU		

4000

NR CRT	DATA	POZ. REZ. NR. CIST.	EMISII CC24	UM	VALOARE DETERMINAT
49	8 08 2007	B75/4 V74/4 cist 9172	Nu Nu Nu		
50	9-08-2007	B75/4 V74/4 cist 1660	NU NU NU		
60	10.08.2007	B75/4 V74/4 cist. 1165	NU NU NU		
61	15.08.2007	B75/4 V74/4 cist 3441	NU NU NU		
62	14.08.2007	B75/4 V74/4 cist 9141	NU NU NU		
63	15.08.2007	B75/4 V74/4 cist 0406	NU NU NU		
64	16.08.2007	V435	NU		
65	17.08.2007	B75/4 ; V74/4 cist 3133	NU Nu		
66	20-08-2007	B75/4 ; V74/4 cist 0414	Nu ; Nu NU		
67	21.08.2007	B75/4 ; V74/4 cist 6432	NU ; NU Nu		
		B75/4 ; V74/4	Nu ; Nu		

✓

*V. Popa*

NR CRT	DATA	POZ. REZ. NR. CIST.	EMISII CCL4	UM	VALOARE DETERMINATA
68	22.08.2007	cist 2528	Nu		
		B75/4 ; V74/4	Nu ; Nu		
69	23.08.2007	cist 1886	Nu		
		B75/4 ; V74/4	Nu ; Nu		
70	24.08.2007	B75/4 ; V74/4	Nu ; Nu		
		cist 1668	Nu		
71	27.08.2007	B75/4 ; V74/4	Nu ; Nu		
		cist 3415	Nu		
72	28.08.2007	B75/4 ; V74/4	Nu ; Nu		
		cist. 9172	Nu		
73	29.08.2007	B75/4 ; V74/4	Nu ; Nu		
		cist. 1660	Nu		
74	30.08.2007	B75/4 ; V74/4	Nu ; Nu		
		cist 1165	Nu		
75	31.08.2007	B75/4 ; V74/4	Nu ; Nu		
		cist. 3441	Nu		

LUNA SEPTEMBRIE 2007

*V. Popa*

76	3.09.2007	V74/4	Nu		
		cist. 9141	Nu		
77	4.09.2007	V74/4	Nu		
		cist. 0406	Nu		
78	5.09.2007	V74/4	Nu		
		cist. V435	Nu		
79	6.09.2007	V74/4	Nu		
		cist. 3133	Nu		
80	7.09.2007	V74/4	Nu		
		cist. 0474	Nu		
81	10.09.2007	V74/4	Nu		
		cist. 6436	Nu		



V. Sp

NR CRT	DATA	POZ. REZ. NR. CIST	EMISII CCI4	U.M.	VALOARE DETERMINATA
82	11.09.2007	V74/4 cist. 2528	Nu Nu		
83	12.09.2007	V74/4 cist. 1884	Nu Nu		
84	13.09.2007	V74/4 cist 1668	Nu Nu		
85	14.09.2007	V74/4 cist 3415	Nu Nu		
86	17.09.2007	V74/4 cist. 9172	Nu Nu		
87	18.09.2007	V74/4 cist. 1660	Nu Nu		
88	19.09.2007	V74/4 cist. 1165	Nu Nu		
89	20.09.2007	V74/4 cist. 3441	Nu Nu		
90	21.09.2007	V74/4 cist. 9141	Nu Nu		
91	24.09.2007	V74/4 cist. 0406	Nu Nu		
92	25.09.2007	V74/4 <del>cist.</del> V455	Nu Nu		
93	26.09.2007	V74/4 cist 3133	Nu Nu		
94	27.09.2007	V74/4 cist. 0414	Nu Nu		
95	28.09.2007	V74/4 cist / 6436	Nu Nu		

V. Sp

NR CRT	DATA	POZ. REZERVOR NR. CISTERNA	EMISII CCL4	U.M.	VALOARE DETERM
LUNA OCTOMBRIE 2007					
96	1. 10. 2007	cist. 2528	Nu		
97	2. 10. 2007	cist. 1884	Nu		
98	3. 10. 2007	cist. 1668	Nu		
99	4. 10. 2007	cist. 3415	Nu		
100	5. 10. 2007	cist. 9172	Nu		
101	8. 10. 2007	cist. 1660	Nu		
102	9. 10. 2007	cist. 1165	Nu		
103	10. 10. 2007	cist. 3441	Nu		
104	11. 10. 2007	cist. 9141	Nu		
105	12. 10. 2007	cist. 0406	Nu		
106	15. 10. 2007	V435	Nu		
107	16. 10. 2007	cist. 3133	Nu		
108	17. 10. 2007	cist. 0414	Nu		
109	18. 10. 2007	cist. 6436	Nu		
110	19. 10. 2007	V74/4	Nu		
111	22. 10. 2007	cist. 2528	Nu		
112	23. 10. 2007	cist. 1884	Nu		
113	24. 10. 2007	cist. 1668	Nu		
114	25. 10. 2007	cist. 3415	Nu		
115	26. 10. 2007	cist. 9172	Nu		
116	29. 10. 2007	cist. 1660	Nu		
117	30. 10. 2007	cist. 1165	Nu		
118	31. 10. 2007	cist. 3441	Nu		
LUNA NOIEMBRIE 2007					
119	1. 11. 2007	cist. 9141	Nu		
120	2. 11. 2007	cist. 0406	Nu		
121	5. 11. 2007	V435	Nu		
122	6. 11. 2007	cist. 3133	Nu		

NR CRT	DATA	POZ. REZERVA.	EMISII	D.M.	VALOARE DETERMINATA
		NR. CIST	CC4		
133	7. 11. 2007	cist. 0414	Nu		
134	8. 11. 2007	cist. 6436	Nu		
135	9. 11. 2007	V74/4	Nu		
136	12. 11. 2007	cist. 2528	Nu		
137	13. 11. 2007	cist. 1884	Nu		
138	14. 11. 2007	cist. 1668	Nu		
139	15. 11. 2007	cist. 3415	Nu		
140	16. 11. 2007	cist. 9174	Nu		
141	19. 11. 2007	cist. 1660	Nu		
142	20. 11. 2007	cist. 1165	Nu		
143	21. 11. 2007	cist. 3441	Nu		
144	22. 11. 2007	cist. 9141	Nu		
145	23. 11. 2007	cist. 0406	Nu		
146	26. 11. 2007	cist. V435	Nu		
147	27. 11. 2007	cist. 3133	Nu		
148	28. 11. 2007	cist. 0414	Nu		
149	29. 11. 2007	cist. 6436	Nu		
150	30. 11. 2007	V74/4	Nu		
LUNA DECEMBRIE 2007					
151	03. 12. 2007	V01	Sol (empty)		
152	04. 12. 2007	2528	Nu		
153	05. 12. 2007	1884	Nu		
154	06. 12. 2007	V01	Sol		
155	07. 12. 2007	1668	Nu		
156	10. 12. 2007	V01	Sol		
157	11. 12. 2007	3415	Nu		
158	12. 12. 2007	9172	Nu		
159	13. 12. 2007	V01	Sol		
160	14. 12. 2007	1660	Nu		

S.C. CHIMCOMPLEX S.A. BORZESTI  
INVESTMENTS DEPARTMENT

IP 2010/19.11.2007

Date: 19.11.2007

**Protocol between representatives of S.C. CHIMCOMPLEX and MICHAELIS  
regarding to commissioning of Incineration Plant**

The Incineration Plant was started up on Friday 16.11.2007 at 17:00 and were monitored the working parameters till Monday 19.11.2007 at 17:00.

During this period all the parameters were at normal values, except the following:

1. incinerator temperature was between  $1000^{\circ}\text{C}$  -  $1100^{\circ}\text{C}$  about 68 hours, and between  $1100^{\circ}\text{C}$  -  $1108^{\circ}\text{C}$  about 4 hours.
2. redox value reading at instrument QIRCA 61CQ 002 was about 800 - 900 mV compared to settled 270 - 330 mV.

Also during this period the plant was shut down 3 times:

- on 17.11.2007 between 19:00 and 21:00 : burner shut off whiles liquid pump still running.
- on 18.11.2007 between 12:00 and 13:00 : burner shut off whiles liquid pump still running.
- on 19.11.2007 between 07:00 and 08:00: flue gas fan shut down.

The capacity of the plant reached 83 kg/h liquid waste incinerated.

Concentration of the HCl solution was min. 15 %, and total quantity produced was 22.000 kg in 72 hour of running.

The analyzer shows 0.0 % CO and 10 % O<sub>2</sub> at stack.

According with the contract CHIMCOMPLEX will arrange in the week 48 / 2007 with an authorized romanian laboratory the measurements of the following emissions at stack (on cost of MICHAELIS) : HCl , Cl<sub>2</sub> , dust , TOC , NOx.

Also in conformity with the contract MICHAELIS will arrange with an EU authorized laboratory on the cost of MICHAELIS, dioxins and furanes measurements.

On 19.11.2007 the operating personal was trained on the unit according to the "instruction advice" supplied by MICHAELIS.

In the test period there was attempt to increase the temperature in the incinerator from  $1065^{\circ}\text{C}$  to  $1150^{\circ}\text{C}$  by closing the manual valve 13AA003. This leads to very high underpressure in the incinerator which blow the flame out; we tried to start several times but no result; we returned to the original position and the incinerator start in automatic mode. The results obtained in this period are not satisfied (several stops, adjustments in the PLC program) and we consider that the test must be repeated under supervision of MICHAELIS representative.

Also MICHAELIS must make an revision / completion of the documentation/ operating manual with: Detailed description of process, Description of control philosophy, Logic diagrams, Documentation for liquid waste pump, Description of functional groups.

CHIMCOMPLEX requests that MICHAELIS repeat the performance test latest on 10.12.2007 , including dioxins /furans analysis.

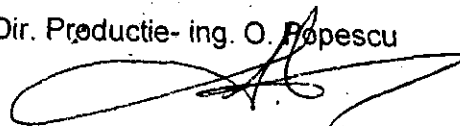
MICHAELIS representative:

i.V. Dr. Andre Tagali



CHIMCOMPLEX representatives:

Dir. Productie- ing. O. Popescu



Dir. Investitii- ing. I. Manea

