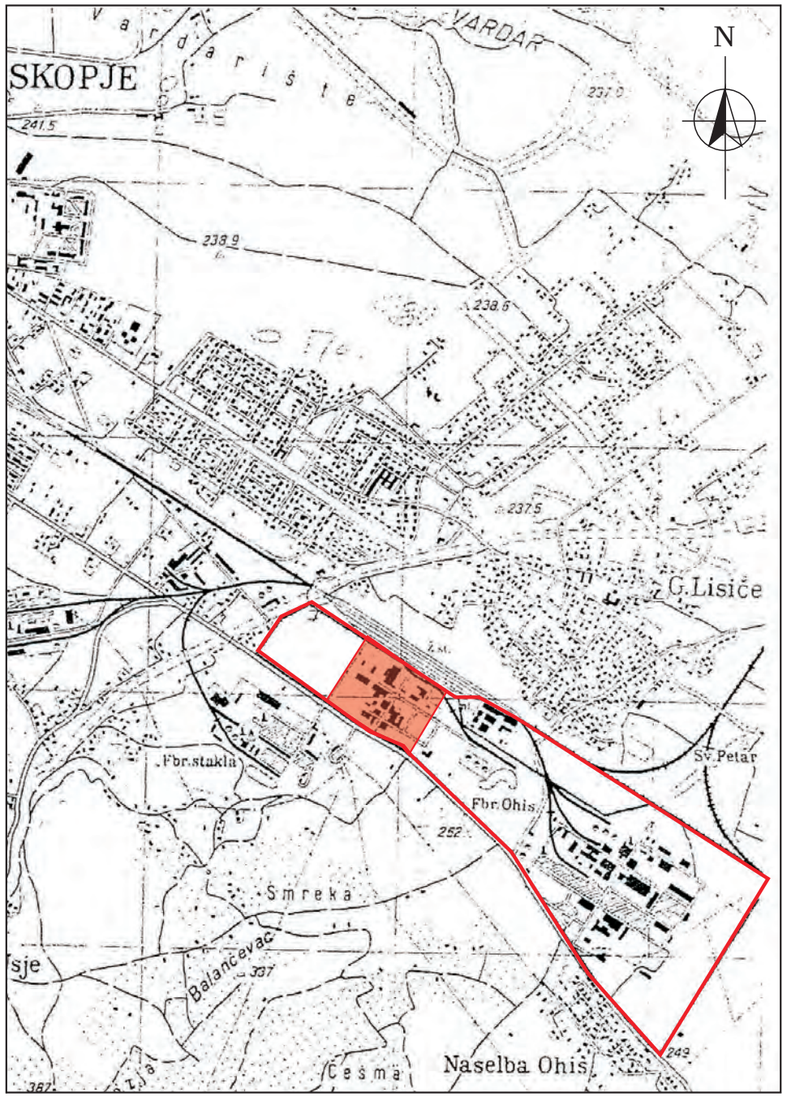

LEGEND

"OHIS SITE" (PROJECT AREA)

OHIS PLANT BOUNDARIES

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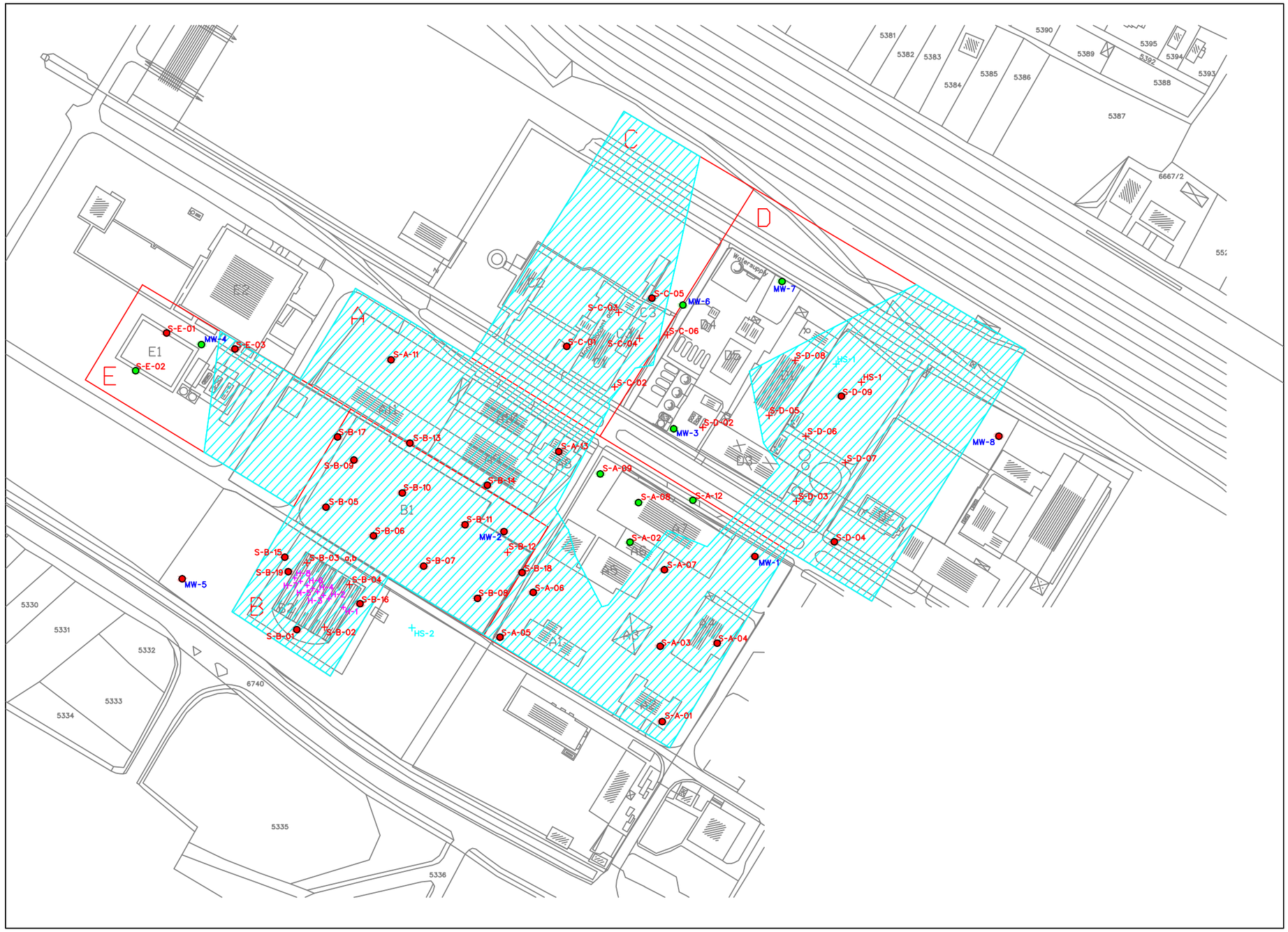
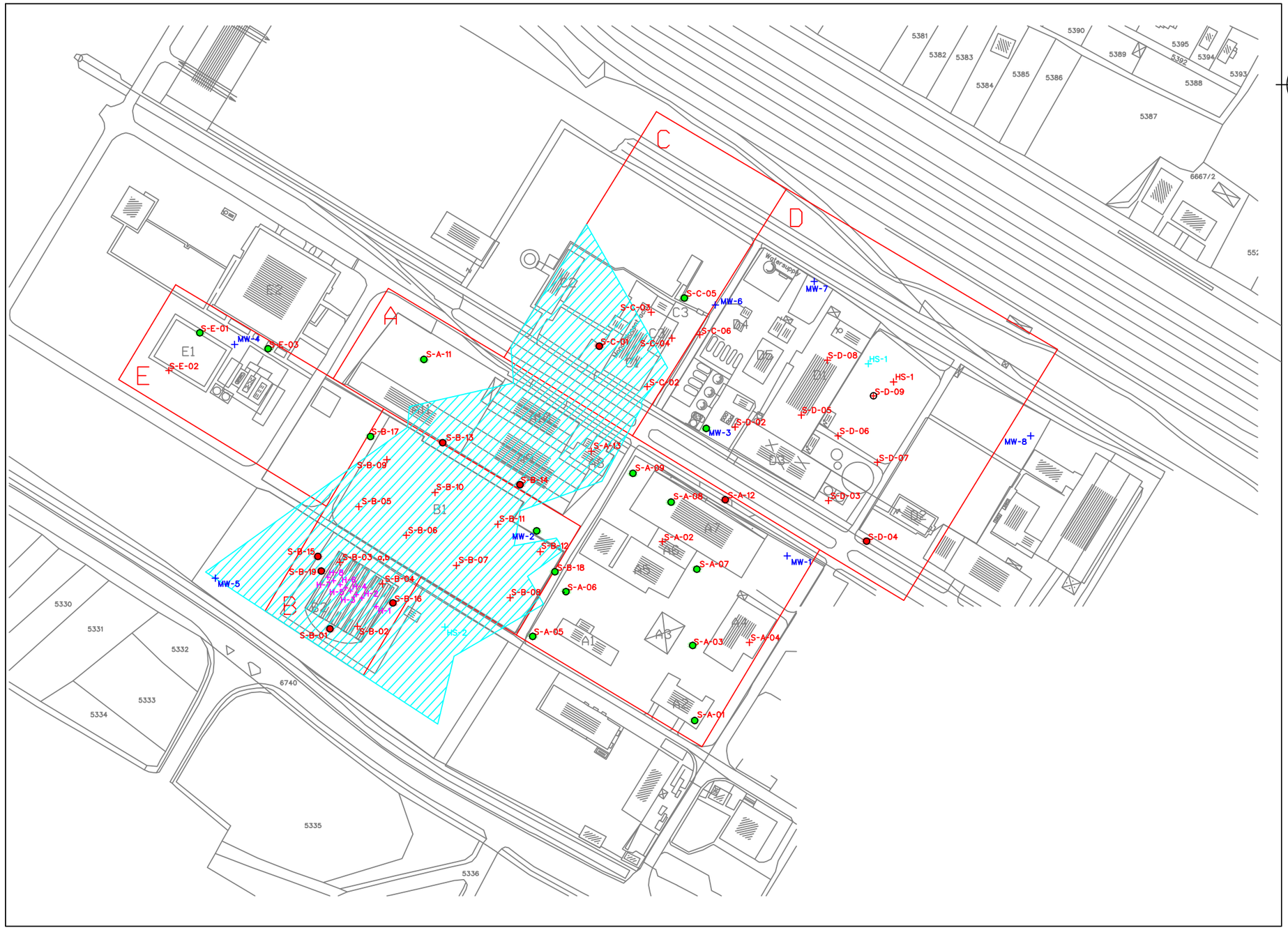
PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE N o	REV	DATA
OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	OHIS PLANT LOCATION MAP	ESEGUITO/BY			09-521-H3	-	1	0	JUNE 2010
		CONTR/CHKD BY							
		APPROV/APPROV BY							

D'APPOLONIA	PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV	DATA
VIA SAN NAZARO, 19 - 16145 GENOVA, ITALIA TEL. +39 010 362 8148 FAX +39 010 362 1078 P. IVA 03476550102 e-mail dappolonia@dappolonia.it www.dappolonia.it	OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	SITE LAYOUT MAP	ESEGUITO/BY			09-521-H3	1:1500	2	0	JUNE 2010
			CONTR/CHKD BY							
			APPROV/APPROVED							



D'APPOLONIA	PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV	DATA
VIA SAN NAZARO, 19 - 16145 GENOVA, ITALIA TEL. +39 010 362 8148 FAX +39 010 362 1078 P. IVA 03476550102 e-mail dappolonia@dappolonia.it www.dappolonia.it	OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	ESTIMATED DISTRIBUTION OF THE HCH SOIL CONTAMINATION SHALLOW LAYER - PLAN VIEW	ESEGUITO/BY			09-521-H3	1:2000	3	0	JUNE 2010
			CONTR/CHKD BY							
			APPROV/APPROV BY							



N

LEGEND

- S-A-01 + SOIL BORING (2007)
- H-1 + DIRECT PUSH PROBE (2007)
- HS-1 + EXISTING MONITORING WELL
- MW-1 + NEW MONITORING WELL (2008)
- SAMPLE EXCEEDING DIV
- SAMPLE BELOW DIV
- HCH CONTAMINATED AREA

SCALE

0 20 40 80 m

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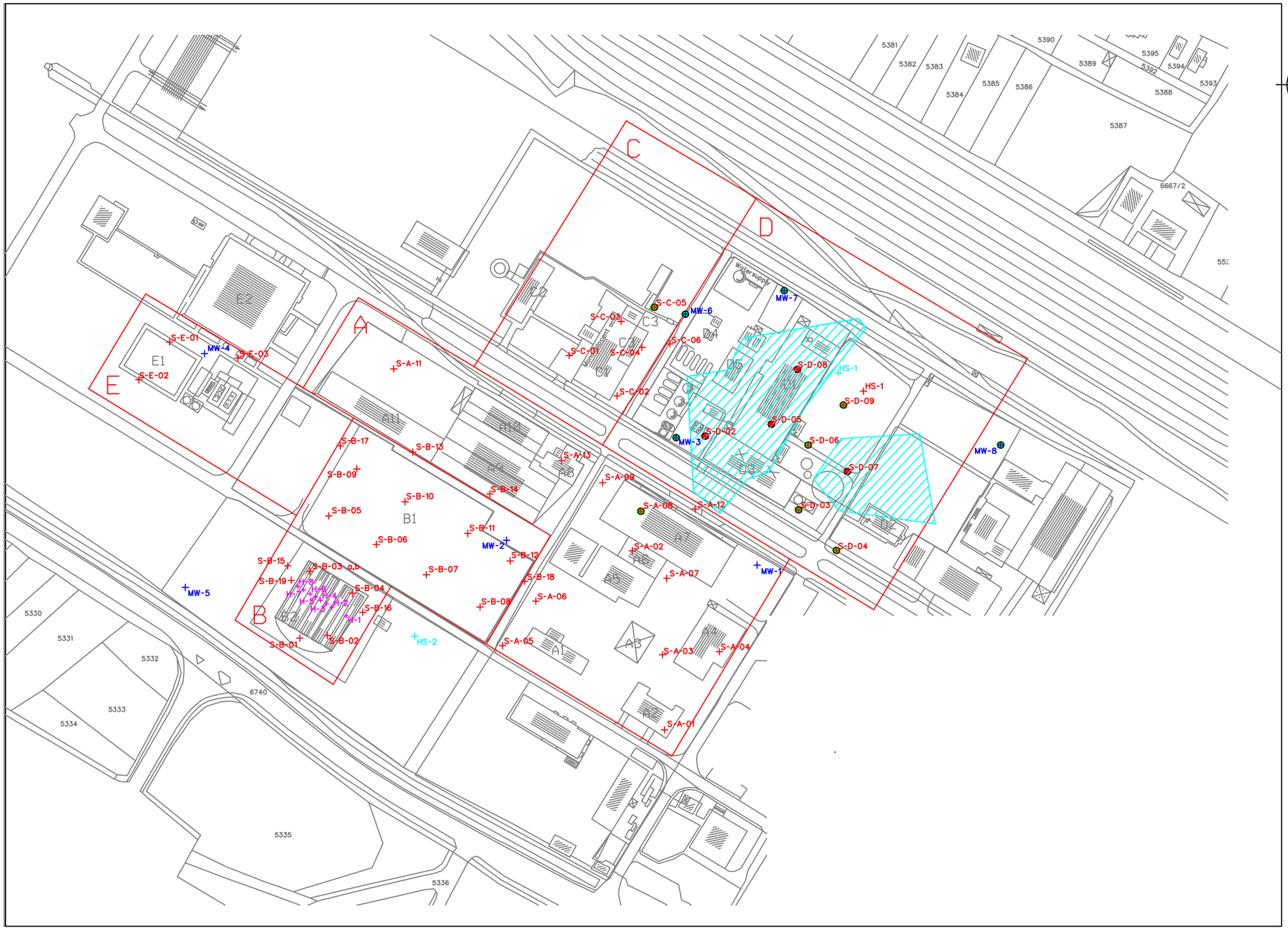
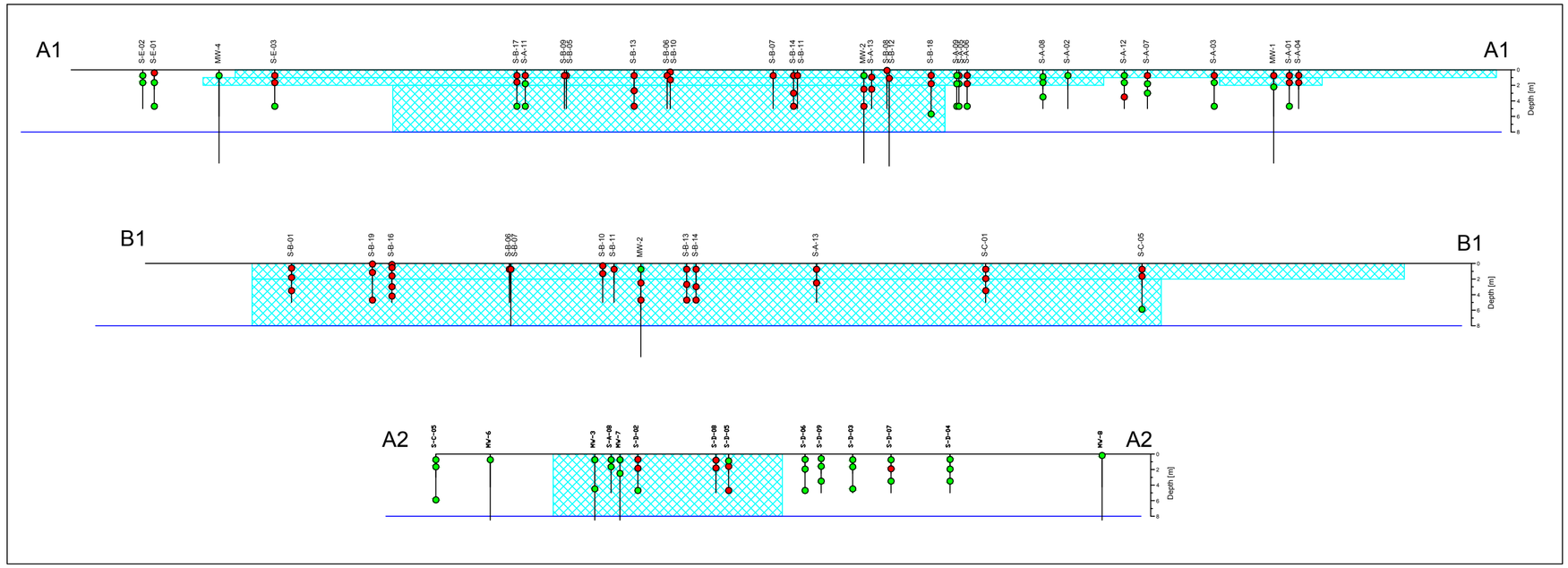
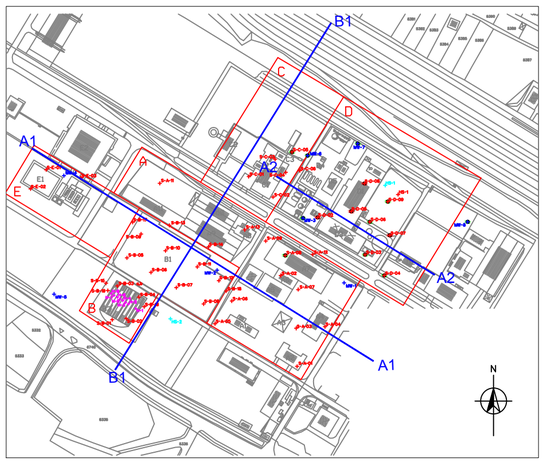
PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV	DATA
OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	ESTIMATED DISTRIBUTION OF THE HCH SOIL CONTAMINATION DEEP LAYER - PLAN VIEW	ESEGUITO/BY			09-521-H3	1:2000	4	0	JUNE 2010
		CONTR/CHKD BY							
		APPROV/APPROV BY							



D'APPOLONIA	PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV	DATA
VIA SAN NAZARO, 19 - 16145 GENOVA, ITALIA TEL. +39 010 362 8148 FAX +39 010 362 1078 P. IVA 03476550102 e-mail dappolonia@dappolonia.it www.dappolonia.it	OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	ESTIMATED DISTRIBUTION OF THE Hg SOIL CONTAMINATION PLAN VIEW	ESEGUITO/BY			09-521-H3	1:2000	5	0	JUNE 2010
			CONTR/CHKD BY							
			APPROV/APPROV BY							





SCALE

0 10 20 40 m

LEGEND

- SAMPLE EXCEEDING DIV
- SAMPLE BELOW DIV
- CONTAMINATED AREA

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REV	DATE	DESCRIZIONE/DESCRIPTION	ESEGUITO/BY	CONTR/CHKD BY	APPROV/APPROV BY
0	JUNE 2010	FIRST EMISSION	D'APPOLONIA	D'APPOLONIA	D'APPOLONIA

CLIENTE/CLIENT

Ministry of Environment and Physical Planning (MEPP)

PROGETTO/PROJECT

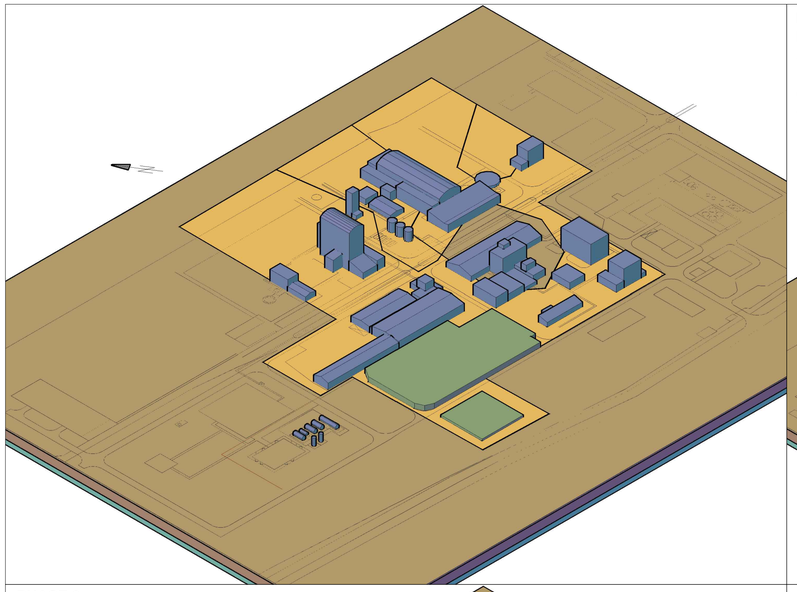
OHIS SITE REMEDIATION PROJECT

TITOLO/TITLE

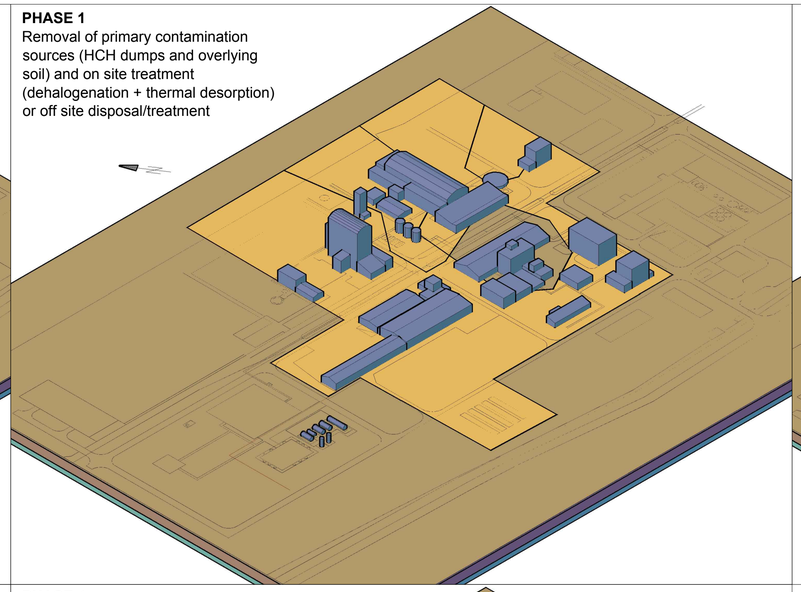
ESTIMATED DISTRIBUTION OF THE HCH AND Hg SOIL CONTAMINATION CROSS SECTIONS

TIMBRO/STAMP

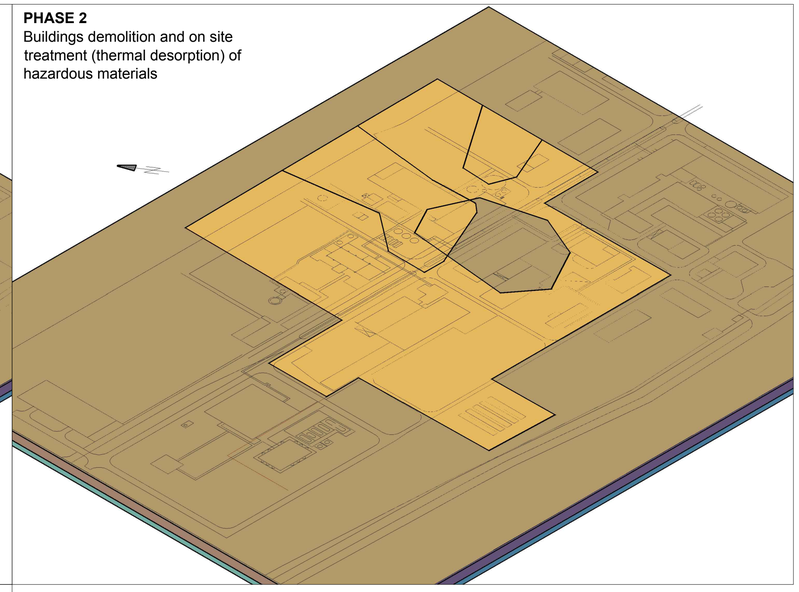
	FIRMA/SIGNATURE	DATA/DATE	No INT/INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV
ESEGUITO/BY	D'APPOLONIA	JUNE 2010	09-521-H3	1:1000	6	0
CONTR/CHKD BY	D'APPOLONIA	JUNE 2010				
APPROV/APPROV BY	D'APPOLONIA	JUNE 2010				



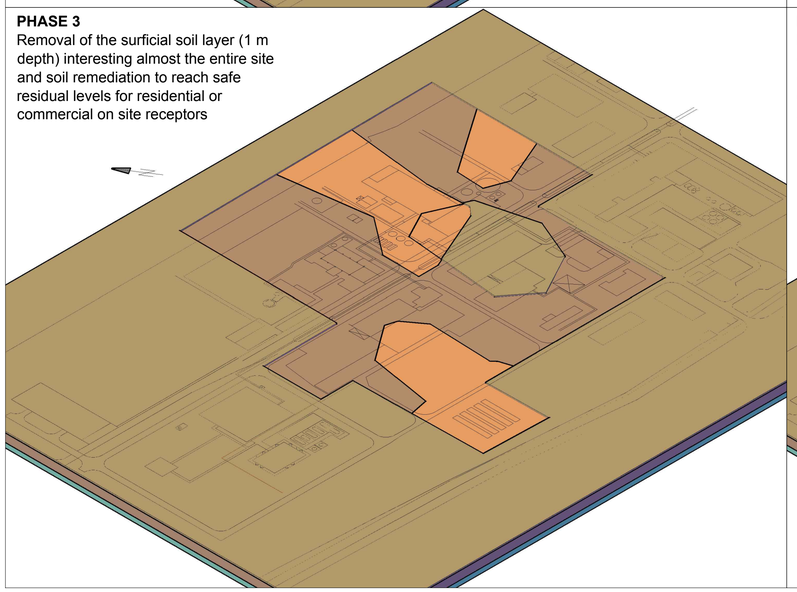
PHASE 1
Removal of primary contamination sources (HCH dumps and overlying soil) and on site treatment (dehalogenation + thermal desorption) or off site disposal/treatment



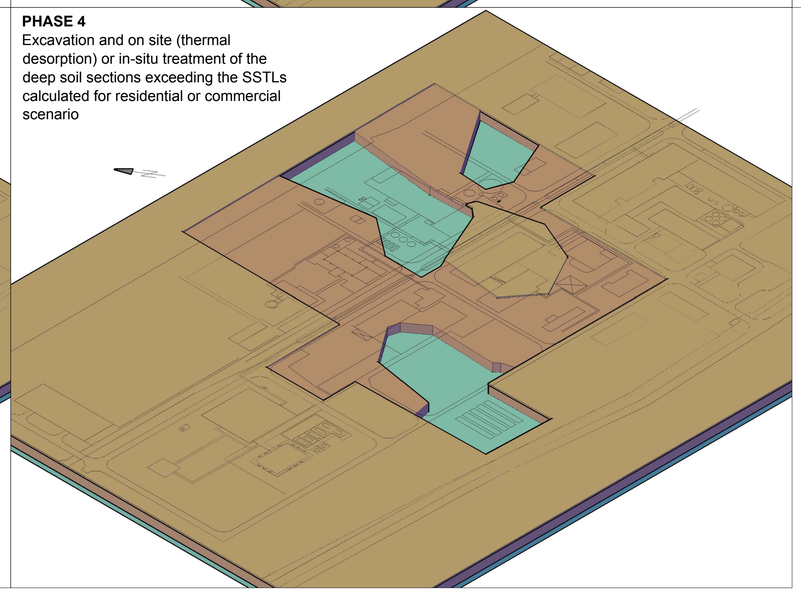
PHASE 2
Buildings demolition and on site treatment (thermal desorption) of hazardous materials



PHASE 3
Removal of the surficial soil layer (1 m depth) interesting almost the entire site and soil remediation to reach safe residual levels for residential or commercial on site receptors



PHASE 4
Excavation and on site (thermal desorption) or in-situ treatment of the deep soil sections exceeding the SSTLs calculated for residential or commercial scenario



LEGEND

- DUMPS
- BUILDINGS TO BE DEMOLISHED
- CONTAMINATED SURFICIAL SOIL
- CONTAMINATED DEEP SOIL
- CLEAN SURFICIAL SOIL
- CLEAN DEEP SOIL
- GROUNDWATER

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REV	DATE	DESCRIZIONE/DESCRIPTION	ESEGUITO/BY	CONTR/CHKD BY	APPROV/APPROV BY
0	JUNE 2010	FIRST EMISSION	D'APPOLONIA	D'APPOLONIA	D'APPOLONIA

CLIENTE/CLIENT
Ministry of Environment and Physical Planning (MEPP)

PROGETTO/PROJECT
OHIS SITE REMEDIATION PROJECT

TITOLO/TITLE
REMEDIATION PHASES

TIMBRO/STAMP

	FIRMA/SIGNATURE	DATA/DATE	No INT/INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV
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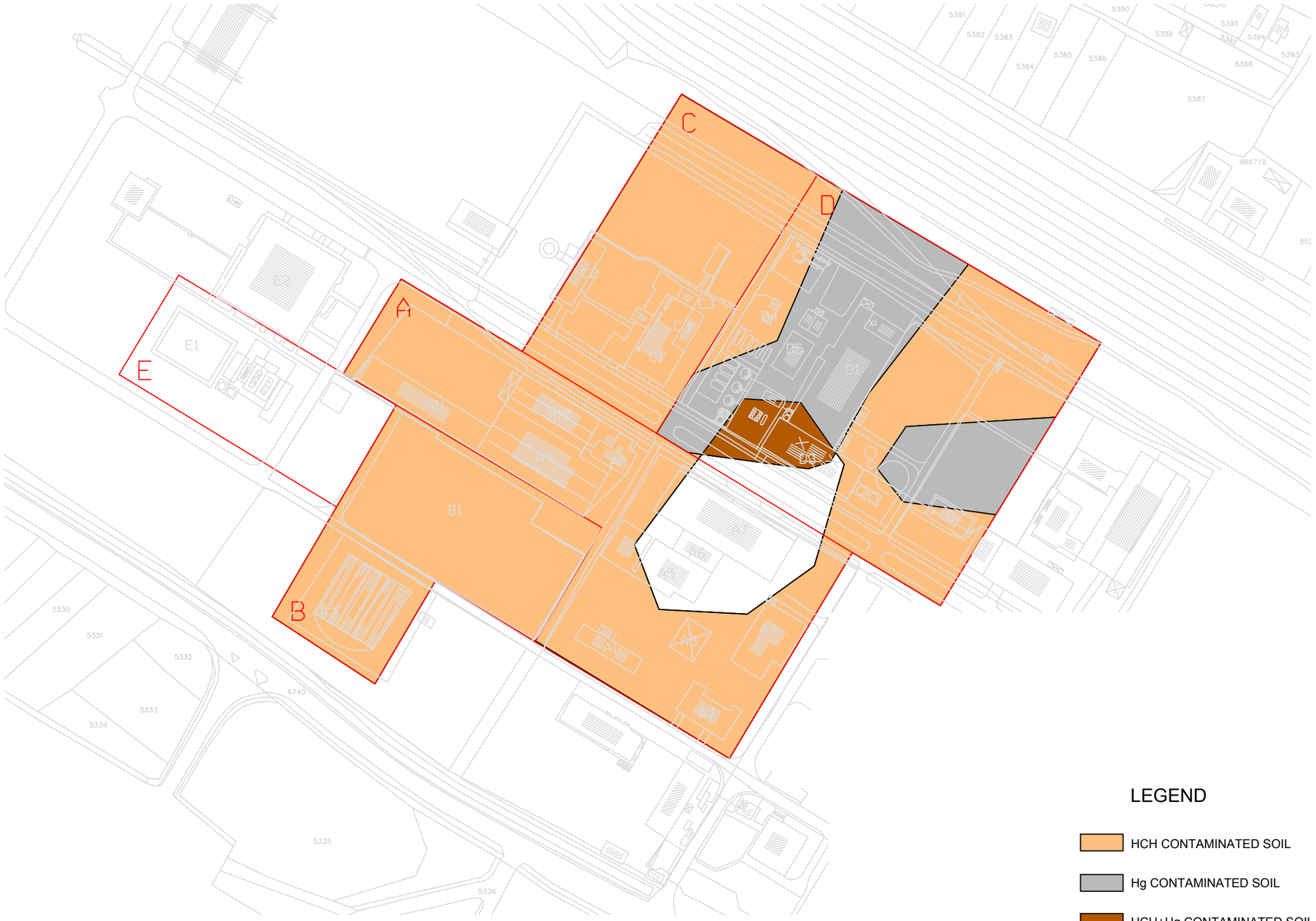
CONTR/CHKD BY	D'APPOLONIA	JUNE 2010				
APPROV/APPROV BY	D'APPOLONIA	JUNE 2010				



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PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV	DATA
OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	REMEDIAL SURFACES FOR 0-1 m bgl SOIL LAYER FOR COMMERCIAL SCENARIO	ESEGUITO/BY	D'APPOLONIA	JUNE 2010	09-521-H3	1:2000	8	0	JUNE 2010
		CONTR/CHKD BY	D'APPOLONIA	JUNE 2010					
		APPROV/APPROV BY	D'APPOLONIA	JUNE 2010					

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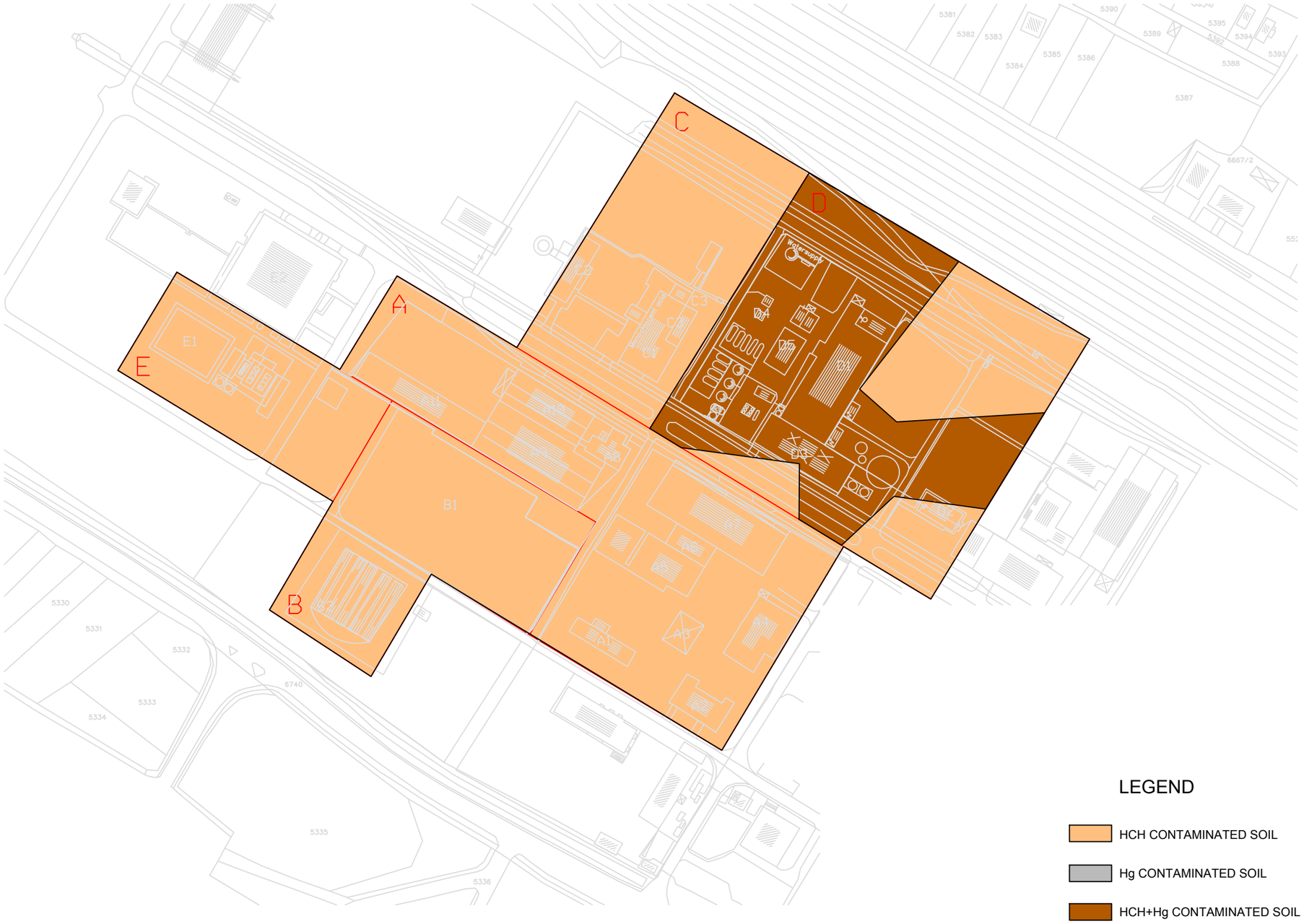
PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV	DATA
OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	REMEDIAL SURFACES FOR 1-8 m bgl SOIL LAYER FOR COMMERCIAL SCENARIO	ESEGUITO/BY	D'APPOLONIA	JUNE 2010	09-521-H3	1:2000	9	0	JUNE 2010
		CONTR/CHKD BY	D'APPOLONIA	JUNE 2010					
		APPROV/APPROV BY	D'APPOLONIA	JUNE 2010					



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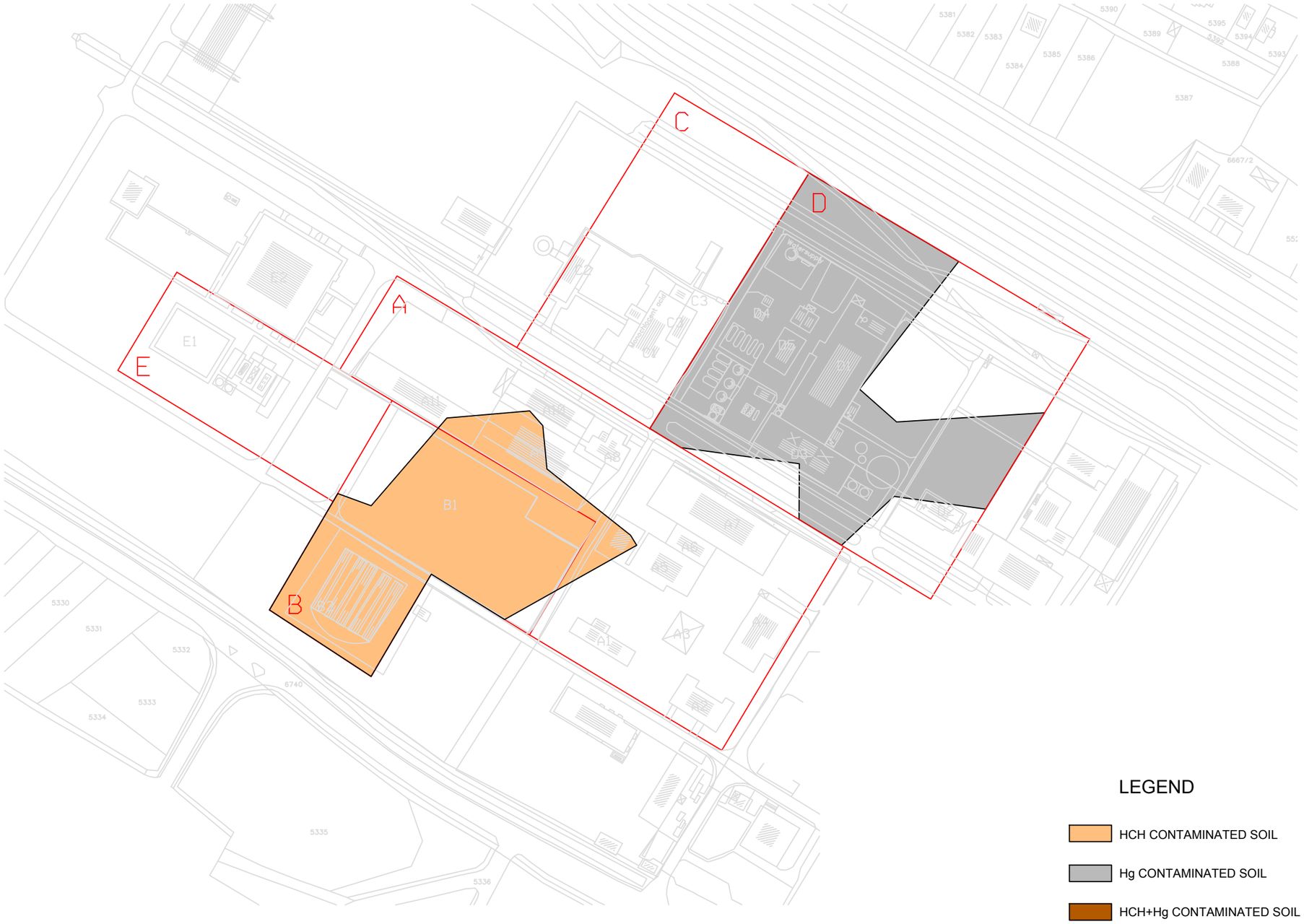
PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV	DATA
OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	REMEDIAL SURFACES FOR 0-1 m bgl SOIL LAYER FOR RESIDENTIAL SCENARIO	ESEGUITO/BY	D'APPOLONIA	JUNE 2010	09-521-H3	1:2000	10	0	JUNE 2010
		CONTR/CHKD BY	D'APPOLONIA	JUNE 2010					
		APPROV/APPROV BY	D'APPOLONIA	JUNE 2010					



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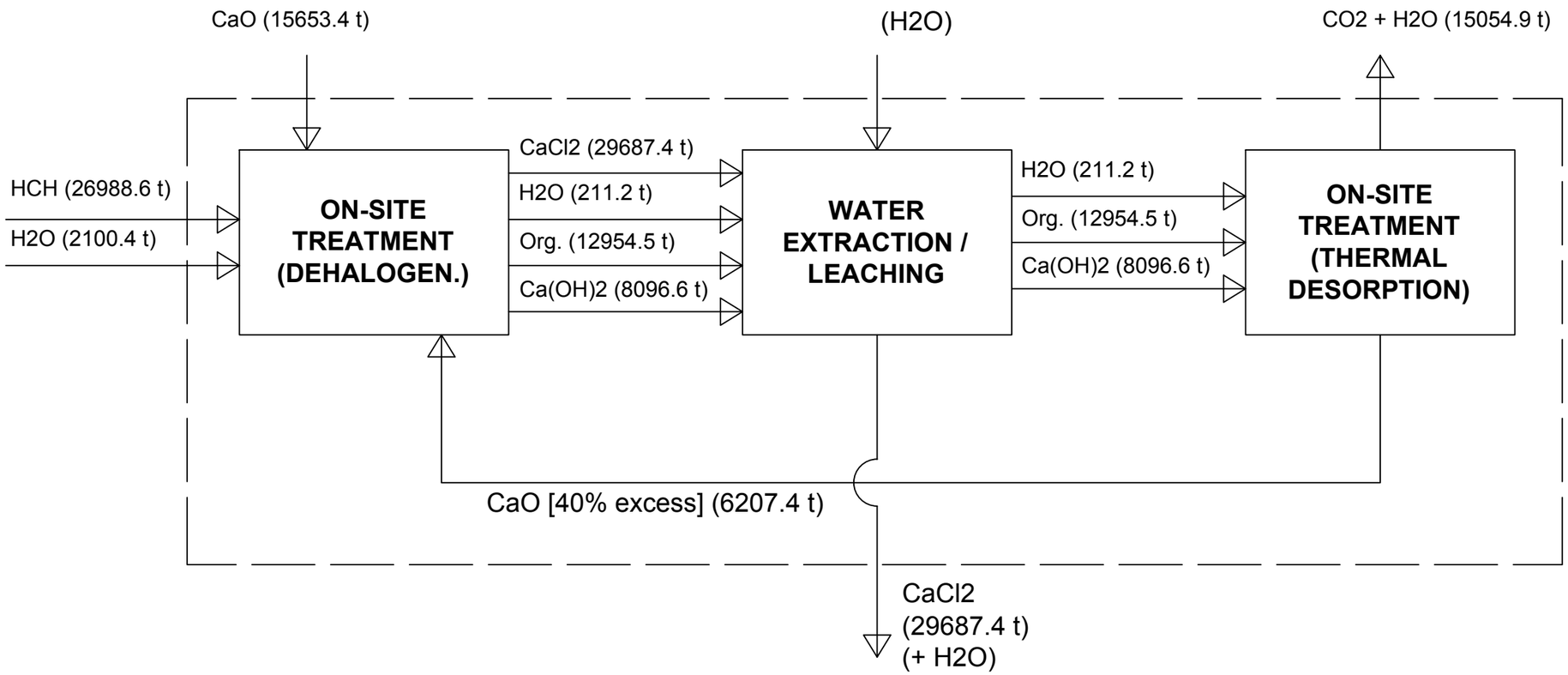
PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV	DATA
OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	REMEDIAL SURFACES FOR 1-8 m bgl SOIL LAYER FOR RESIDENTIAL SCENARIO	ESEGUITO/BY	D'APPOLONIA	JUNE 2010	09-521-H3	1:2000	11	0	JUNE 2010
		CONTR/CHKD BY	D'APPOLONIA	JUNE 2010					
		APPROV/APPROV BY	D'APPOLONIA	JUNE 2010					



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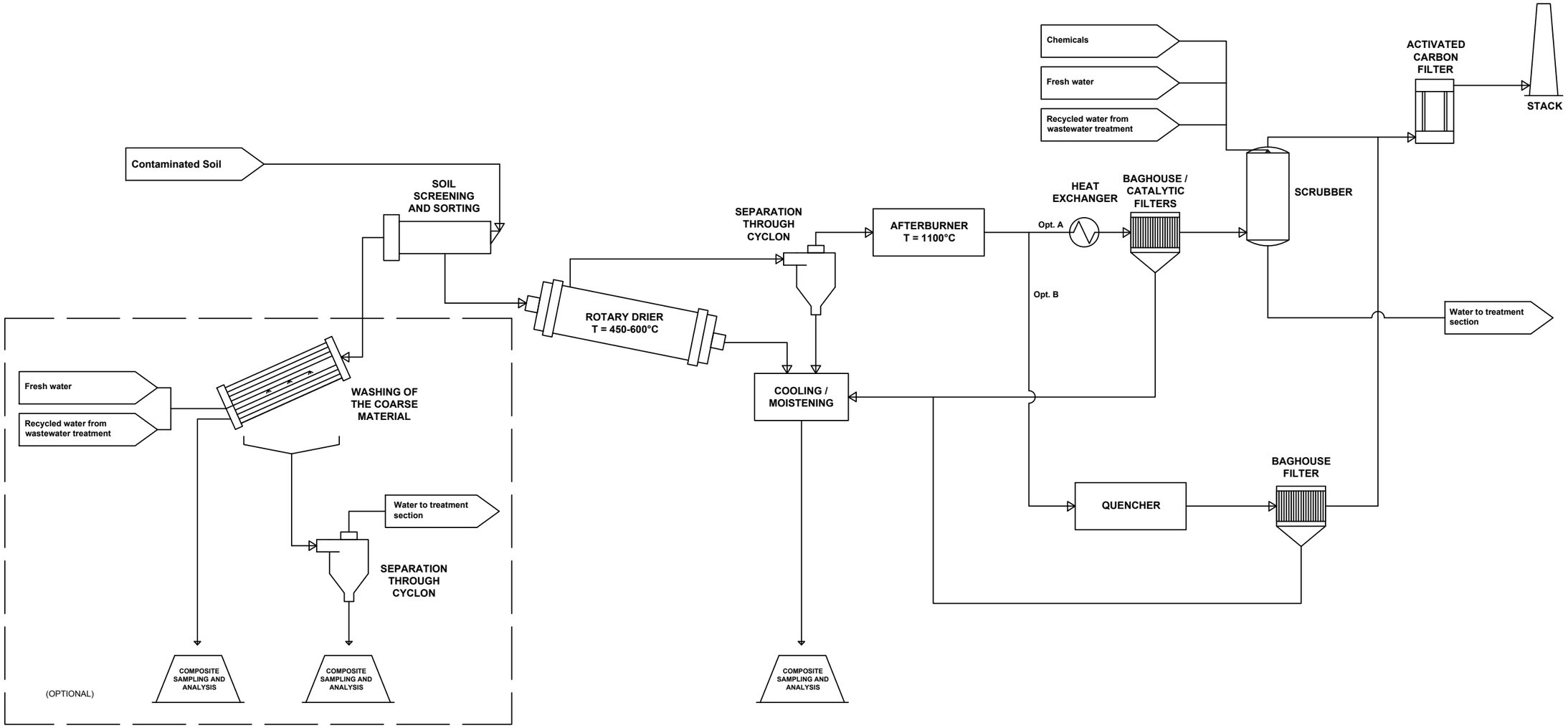
PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV	DATA
OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	HCH MECHANOCHEMICAL DEHALOGENATION PROCESS FLOW DIAGRAM	ESEGUITO/BY	D'APPOLONIA	JUNE 2010	09-521-H3	-	12	0	JUNE 2010
		CONTR/CHKD BY	D'APPOLONIA	JUNE 2010					
		APPROV/APPROV BY	D'APPOLONIA	JUNE 2010					



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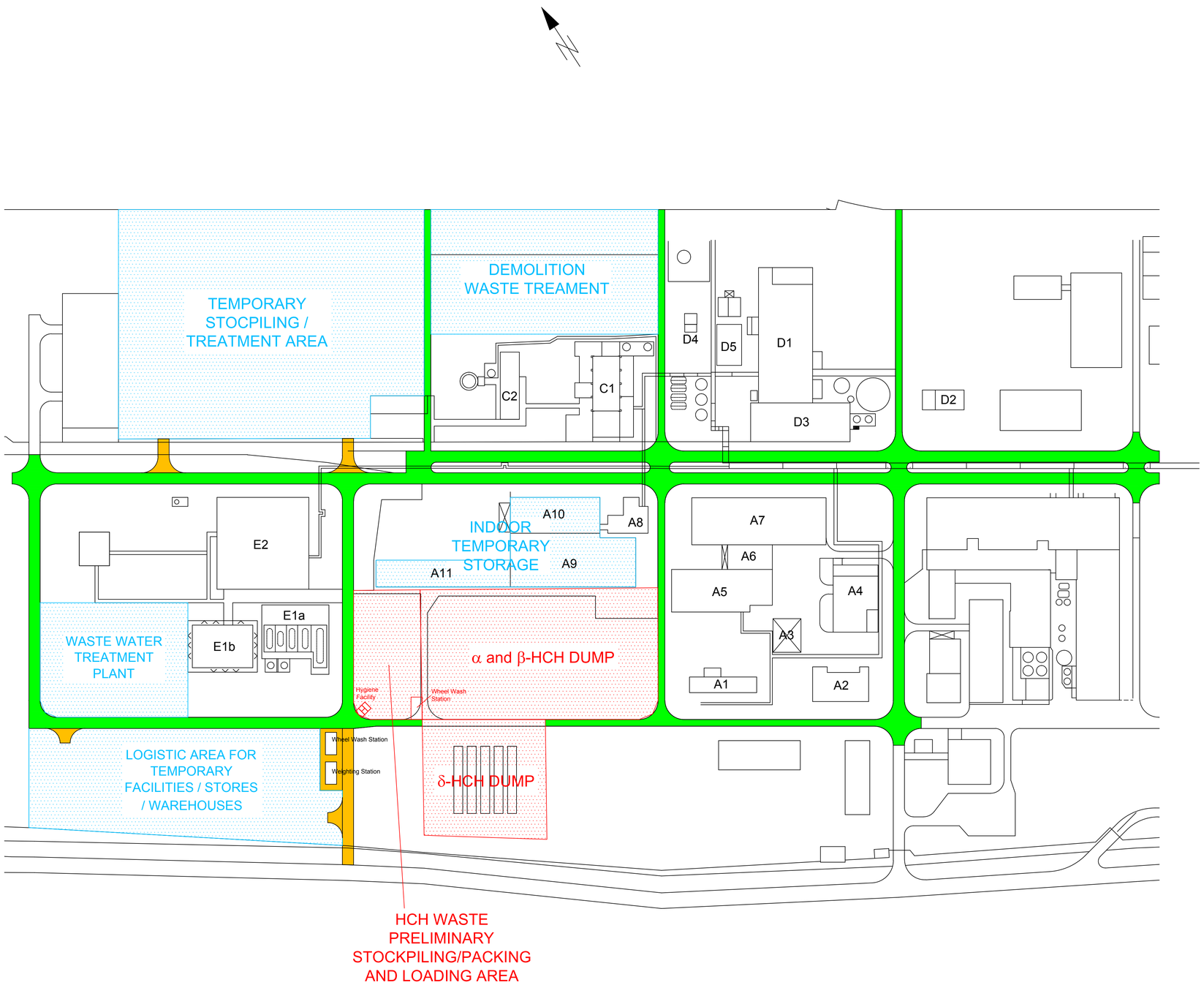
PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV	DATA
OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	THERMAL DESORPTION PROCESS DIAGRAM	ESEGUITO/BY	D'APPOLONIA	JUNE 2010	09-521-H3	-	13	0	JUNE 2010
		CONTR/CHKD BY	D'APPOLONIA	JUNE 2010					
		APPROV/APPROV BY	D'APPOLONIA	JUNE 2010					



LEGEND

- OPERATIVE/LOGISTIC AREA
- HCH WASTE HANDLING EXCLUSION AREA
- EXISTING INTERNAL ROADS
- NEW INTERNAL ROADS

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REV	DATE	DESCRIZIONE/DESCRIPTION	ESEGUITO/BY	CONTR/CHKD BY	APPROV/APPROV BY
0	JUNE 2010	FIRST EMISSION	D'APPOLONIA	D'APPOLONIA	D'APPOLONIA

CLIENTE/CLIENT

Ministry of Environment and Physical Planning (MEPP)

PROGETTO/PROJECT

OHIS SITE REMEDIATION PROJECT

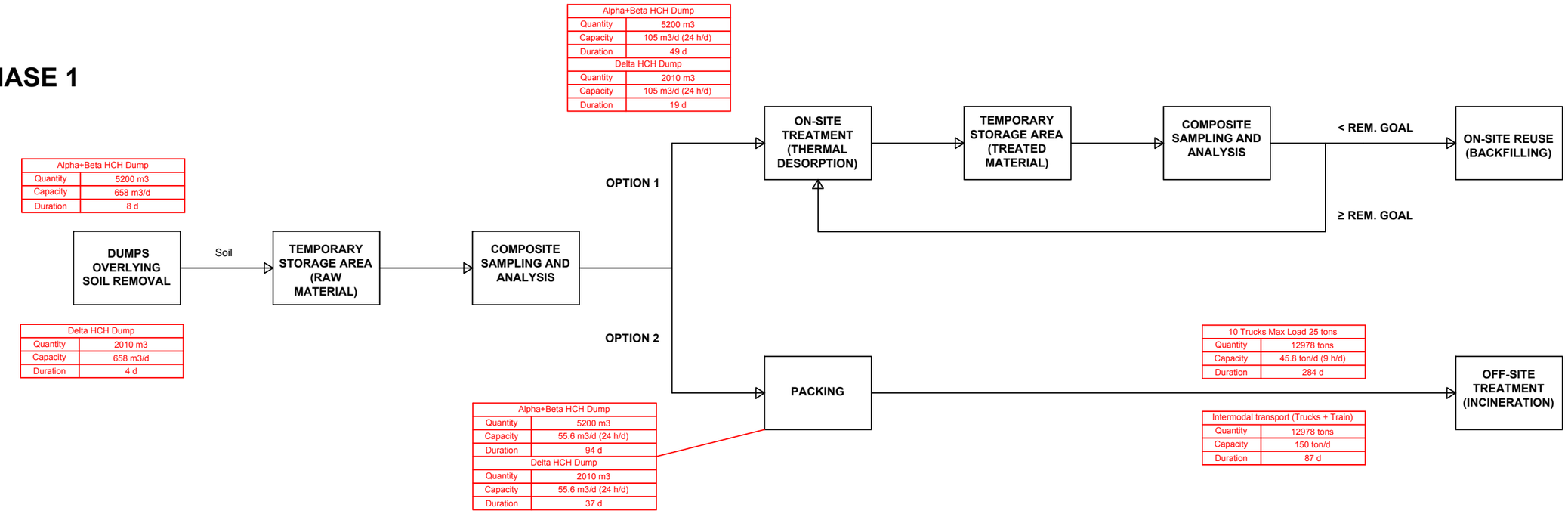
TITOLO/TITLE

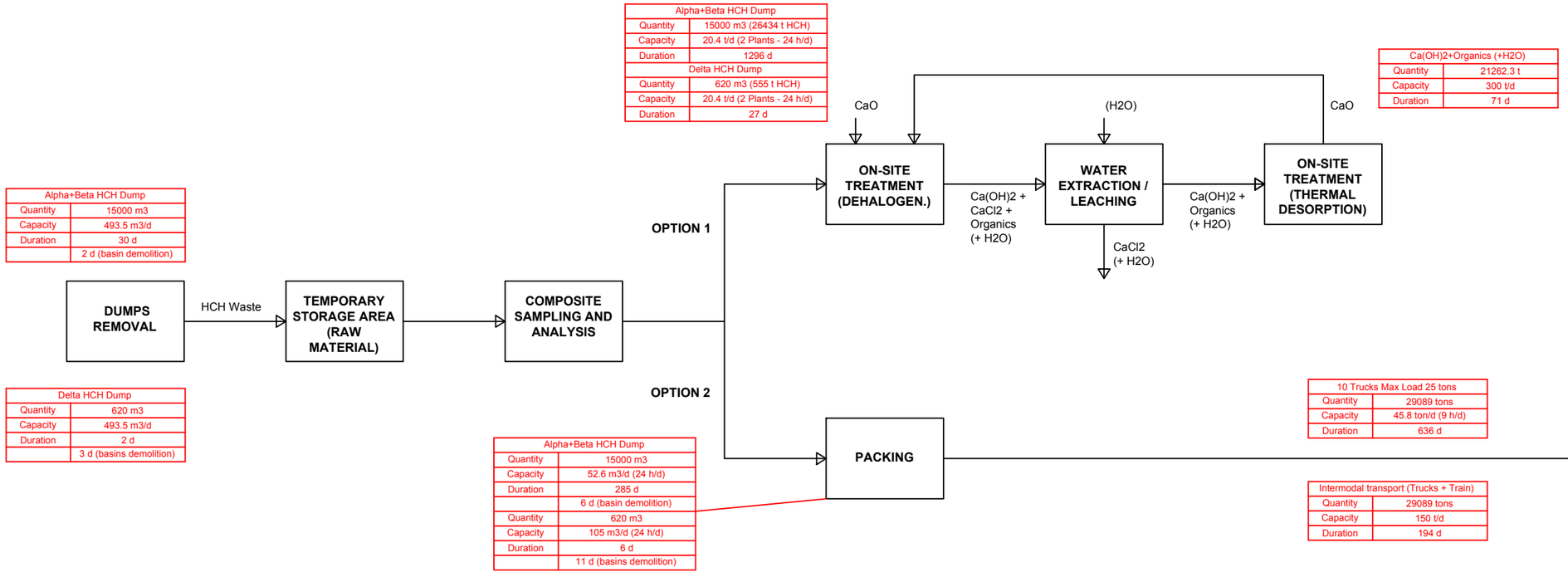
PLANNED WORKING OPERATION LAYOUT

TIMBRO/STAMP

	FIRMA/SIGNATURE	DATA/DATE	No INT/INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV
ESEGUITO/BY	D'APPOLONIA	JUNE 2010	09-521-H3	1:1000	14	0
CONTR/CHKD BY	D'APPOLONIA	JUNE 2010				
APPROV/APPROV BY	D'APPOLONIA	JUNE 2010				

PHASE 1





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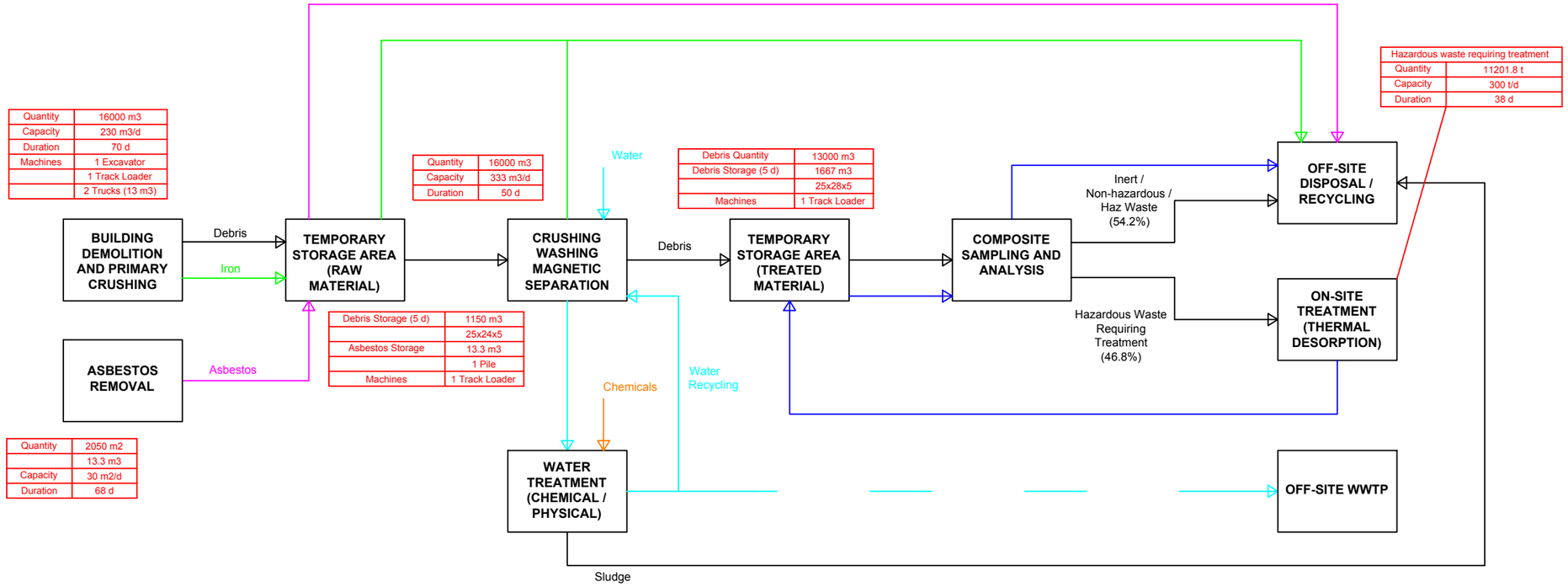
PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV	DATA
OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	PHASE 1 - PROCESS DIAGRAM	ESEGUITO/BY	D'APPOLONIA	JUNE 2010	09-521-H3	-	15	0	JUNE 2010
		CONTR/CHKD BY	D'APPOLONIA	JUNE 2010					
		APPROV/APPROV BY	D'APPOLONIA	JUNE 2010					

PHASE 2



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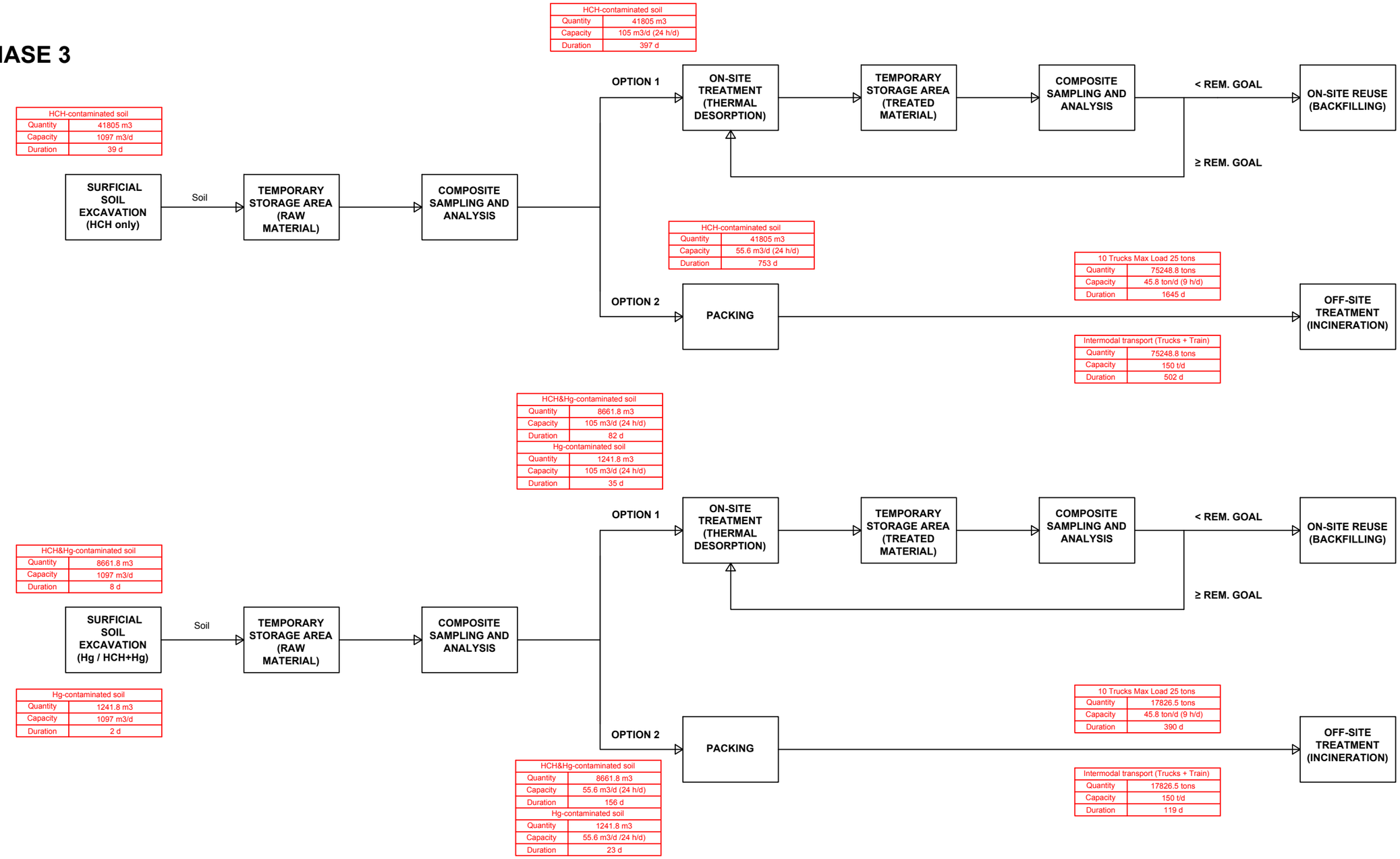
PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV	DATA
OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	PHASE 2 - PROCESS DIAGRAM	ESEGUITO/BY	D'APPOLONIA	JUNE 2010	09-521-H3	-	16	0	JUNE 2010
		CONTR/CHKD BY	D'APPOLONIA	JUNE 2010					
		APPROV/APPROV BY	D'APPOLONIA	JUNE 2010					

PHASE 3



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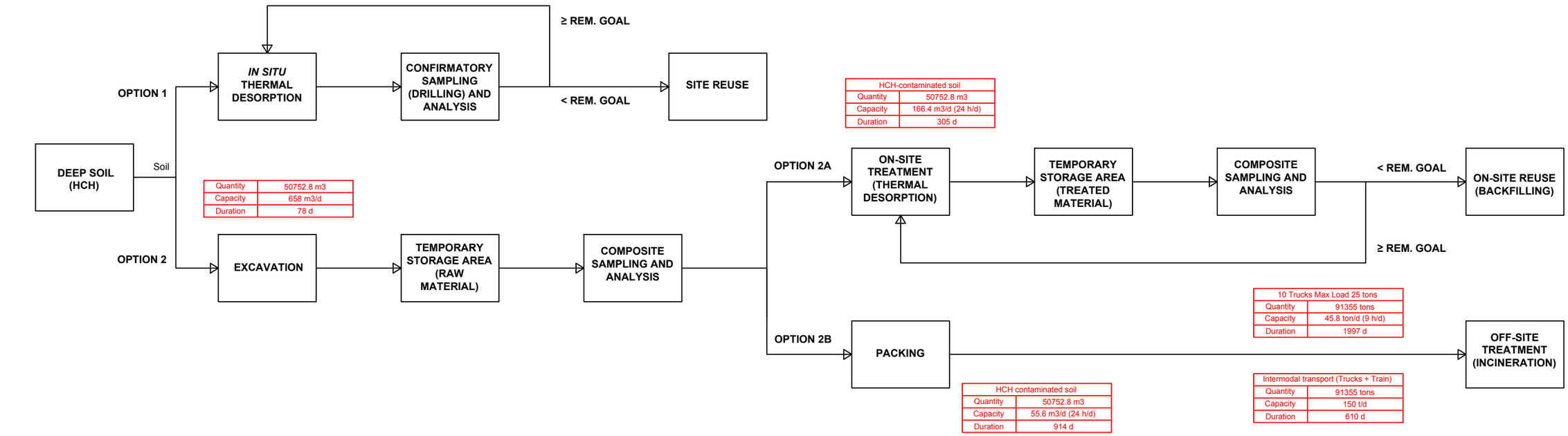
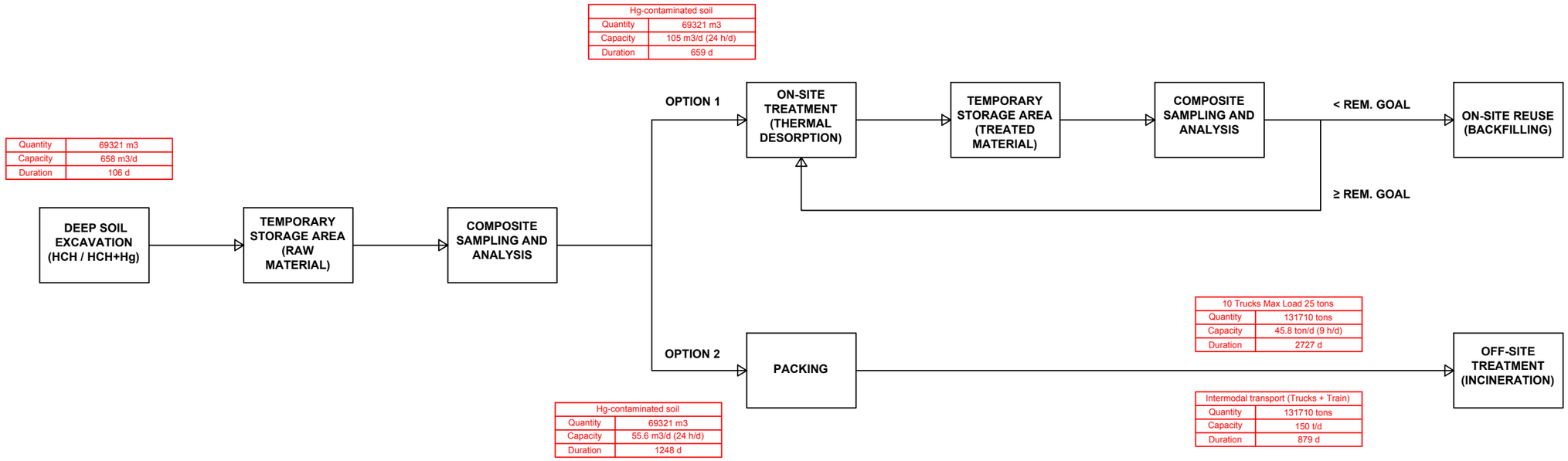
PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV	DATA
OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	PHASE 3 - PROCESS DIAGRAM	ESEGUITO/BY	D'APPOLONIA	JUNE 2010	09-521-H3	-	17	0	JUNE 2010
		CONTR/CHKD BY	D'APPOLONIA	JUNE 2010					
		APPROV/APPROV BY	D'APPOLONIA	JUNE 2010					

PHASE 4





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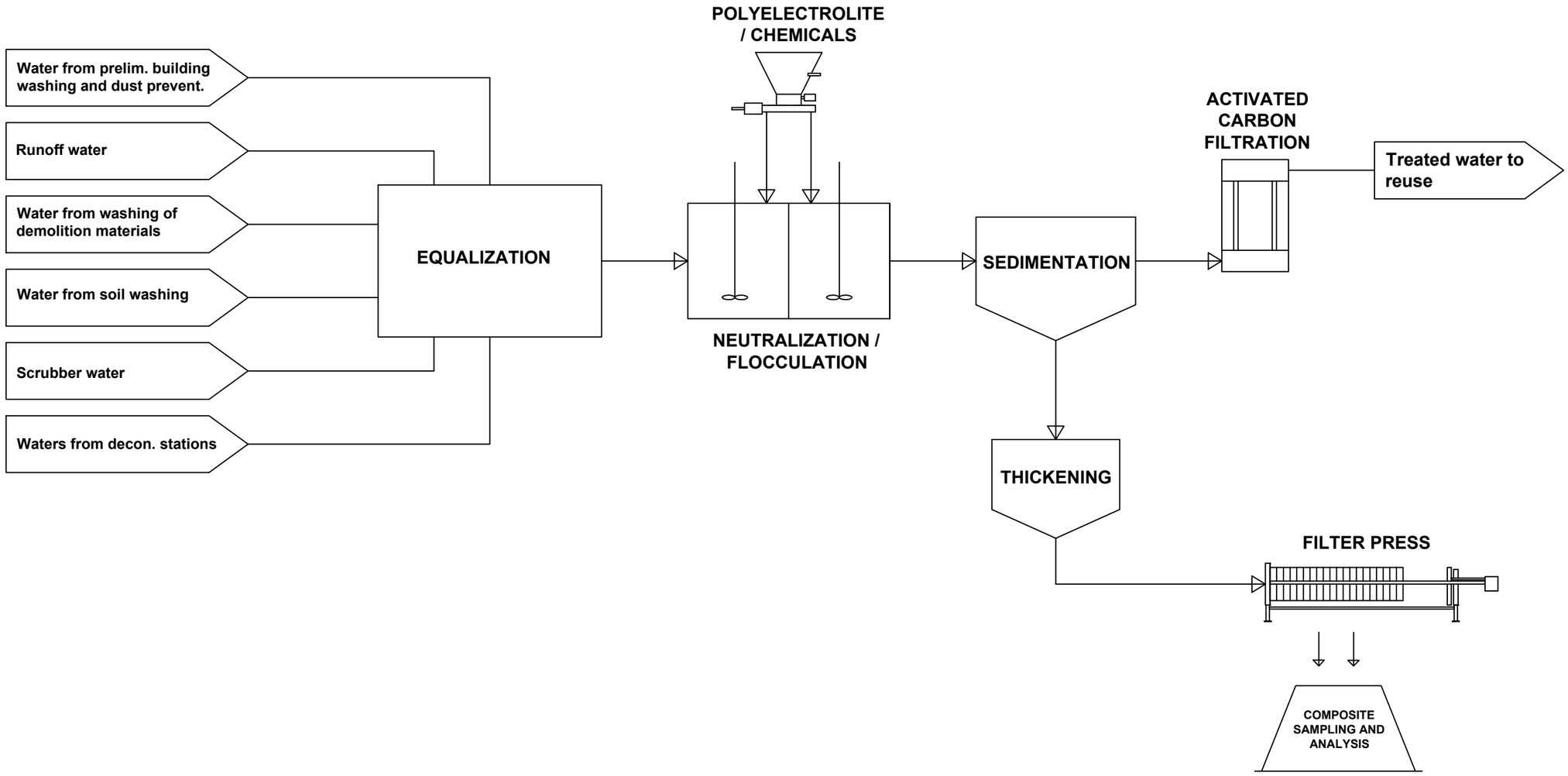
PROGETTO/PROJECT	TITOLO/TITLE		FIRMA/SIGNATURE	DATA/DATE	No INT/ INTERNAL No	SCALA/SCALE	TAV/PLATE No	REV	DATA
OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	PHASE 4 - PROCESS DIAGRAM	ESEGUITO/BY	D'APPOLONIA	JUNE 2010	09-521-H3	-	18	0	JUNE 2010
		CONTR/CHKD BY	D'APPOLONIA	JUNE 2010					
		APPROV/APPROV BY	D'APPOLONIA	JUNE 2010					



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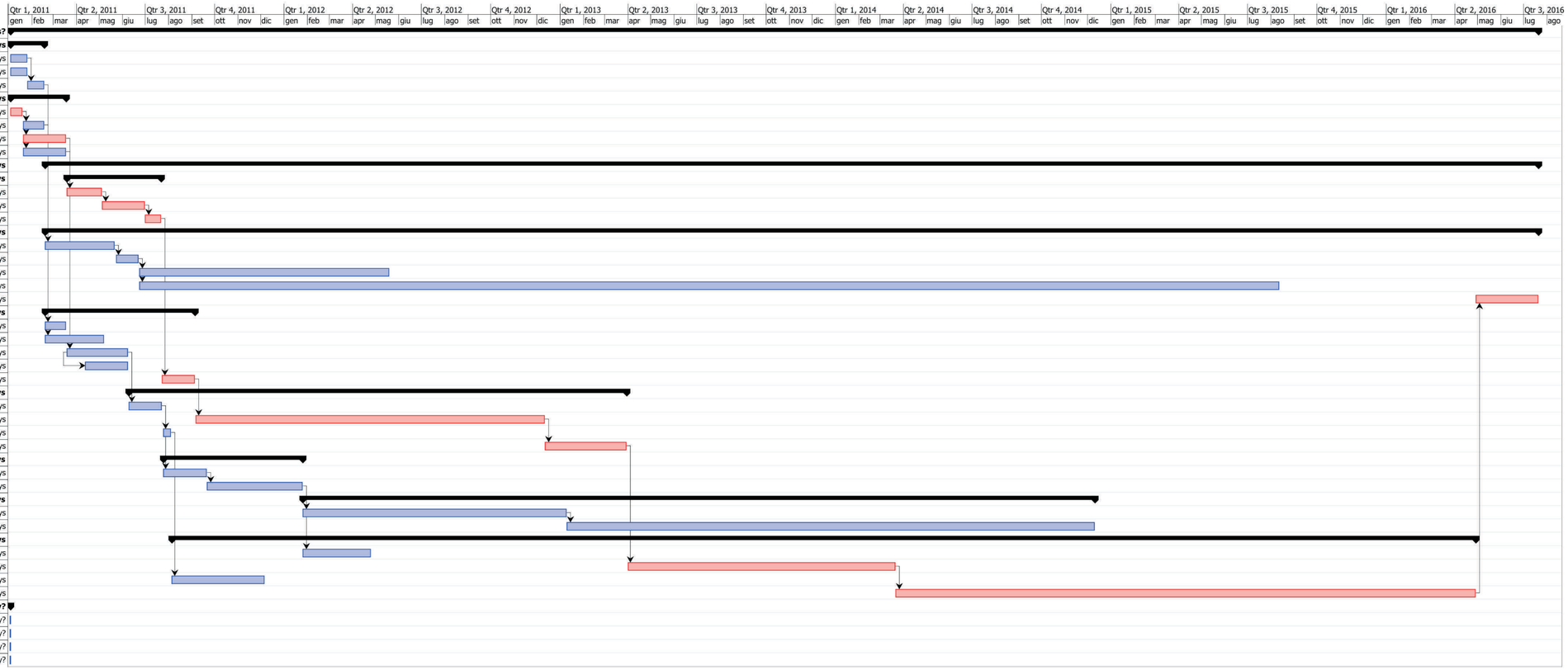
OHIS CLEANUP PROJECT CONCEPTUAL DESIGN	WASTEWATER TREATMENT PROCESS DIAGRAM	ESEGUITO/BY	D'APPOLONIA	JUNE 2010	09-521-H3	-	19	0	JUNE 2010
		CONTR/CHKD BY	D'APPOLONIA	JUNE 2010					
		APPROV/APPROV BY	D'APPOLONIA	JUNE 2010					

	Name	Duration
1	**OHIS SITE REMEDIATION PROJECT**	**1.737 days?**
2	**PILOT TESTING PHASE**	**40 days**
3	Dehalogenation pilot test on HCH waste (4 tests x 60 kg each)	20 days
4	Thermal desorption pilot test on soil	20 days
5	Thermal desorption pilot test on dehalogenated waste	20 days
6	**WORK SITE INSTALLATION**	**65 days**
7	Temporary facilities installation, fences, work site installation	15 days
8	Demolition waste treatment area building	25 days
9	Temporary stocpile and soil treatment area building	50 days
10	Wastewater treatment area building and WWTP installation	50 days
11	**PHASE 1 - DUMPS REMOVAL**	**1.697 days**
12	**HCH DUMPS OVERLYING SOIL REMOVAL AND TREATMENT**	**108 days**
13	Thermal desorber mob and installation	40 days
14	Alpha+beta HCH dump overlying soil removal and thermal desorption	49 days
15	Delta HCH dump overlying soil removal and thermal desorption	19 days
16	**HCH DUMPS WASTE REMOVAL AND TREATMENT**	**1.697 days**
17	Mechanochem Dehalogenator building/installation (inside A9-A11 buildings)	80 days
18	Delta HCH dump waste removal and dehalogenation	27 days
19	Alpha+Beta HCH dump waste removal	285 days
20	Alpha+Beta HCH dump wastedehalogenation	1.296 days
21	Dehalogenated HCH waste thermal desorption	71 days
22	**PHASE 2 - BUILDINGS DEMOLITION**	**171 days**
23	Demolition material pre-treatment plant installation	25 days
24	Asbestos removal	68 days
25	Buildings and structures demolition	70 days
26	Crushing/Washing/Magnetic separation	50 days
27	Hazardous waste treatment (thermal desorption)	38 days
28	**PHASE 3 - SURFICIAL SOIL REMOVAL AND TREATMENT**	**567 days**
29	HCH-contaminated surficial soil excavation	39 days
30	HCH-contaminated soil treatment (thermal desorption)	397 days
31	HCH-Hg-contaminated surficial soil excavation	10 days
32	HCH-Hg-contaminated soil treatment (thermal desorption)	94 days
33	**IN-SITU THERMAL DESORPTION PILOT TESTING**	**159 days**
34	Pilot plant installation	50 days
35	Pilot testing	109 days
36	**PHASE 4 - OPT 1 - DEEP SOIL IN-SITU THERMAL DESORPTION**	**900 days**
37	In-situ thermal desorption plant installation	300 days
38	In-situ thermal desorption	600 days
39	**PHASE 4 - OPT 2 - DEEP SOIL REMOVAL AND TREATMENT**	**1.482 days**
40	HCH-contaminated deep soil excavation	78 days
41	HCH-contaminated soil treatment (thermal desorption)	305 days
42	Hg-contaminated deep soil excavation	106 days
43	Hg-contaminated soil treatment (thermal desorption)	659 days
44	**PHASE 5 - PUMP&TREAT**	**1 day?**
45	Pilot testing of P&T system	1 day?
46	WWTP upgrading	1 day?
47	Wells drilling and piping	1 day?
48	Groundwater extraction and treatment	1 day?



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CLIENTE/CLIENT

Ministry of Environment and Physical Planning (MEPP)

PROGETTO/PROJECT

OHIS SITE REMEDIATION PROJECT

TITOLO/TITLE

TIME SCHEDULE
HCH ON SITE TREATMENT

TIMBRO/STAMP

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ESEGUITO/BY	D'APPOLONIA	JUNE 2010	09-521-H3	-	20	0
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APPROV/APPROVED	D'APPOLONIA	JUNE 2010				

	Name	Duration
1	**OHIS SITE REMEDIATION PROJECT**	**1.666 days?**
2	**PILOT TESTING PHASE**	**40 days**
3	Dehalogenation pilot test on HCH waste (4 tests x 60 kg each)	20 days
4	Thermal desorption pilot test on soil	20 days
5	Thermal desorption pilot test on dehalogenated waste	20 days
6	**WORK SITE INSTALLATION**	**65 days**
7	Temporary facilities installation, fences, work site installation	15 days
8	Demolition waste treatment area building	25 days
9	Temporary stocpile and soil treatment area building	50 days
10	Wastewater treatment area building and WWTP installation	50 days
11	**PHASE 1 - DUMPS REMOVAL**	**642 days**
12	**HCH DUMPS OVERLYING SOIL REMOVAL AND TREATMENT**	**108 days**
13	Thermal desorber mob and installation	40 days
14	Alpha+beta HCH dump overlying soil removal and thermal desorption	49 days
15	Delta HCH dump overlying soil removal and thermal desorption	19 days
16	**HCH DUMPS WASTE REMOVAL AND TREATMENT**	**642 days**
17	Delta HCH dump waste removal and off site transport (intermodal tr.)	6 days
18	(Opt 1) Alpha+beta HCH dump waste removal and off site transport (inte...	285 days
19	(Opt 2) Alpha+beta HCH dump waste removal and off site transport (truc...	636 days
20	**PHASE 2 - BUILDINGS DEMOLITION**	**171 days**
21	Demolition material pre-treatment plant installation	25 days
22	Asbestos removal	68 days
23	Buildings and structures demolition	70 days
24	Crushing/Washing/Magnetic separation	50 days
25	Hazardous waste treatment (thermal desorption)	38 days
26	**PHASE 3 - SURFICIAL SOIL REMOVAL AND TREATMENT**	**567 days**
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30	HCH-Hg-contaminated soil treatment (thermal desorption)	94 days
31	**IN-SITU THERMAL DESORPTION PILOT TESTING**	**159 days**
32	Pilot plant installation	50 days
33	Pilot testing	109 days
34	**PHASE 4 - OPT 1 - DEEP SOIL IN-SITU THERMAL DESORPTION**	**900 days**
35	In-situ thermal desorption plant installation	300 days
36	In-situ thermal desorption	600 days
37	**PHASE 4 - OPT 2 - DEEP SOIL REMOVAL AND TREATMENT**	**1.482 days**
38	HCH-contaminated deep soil excavation	78 days
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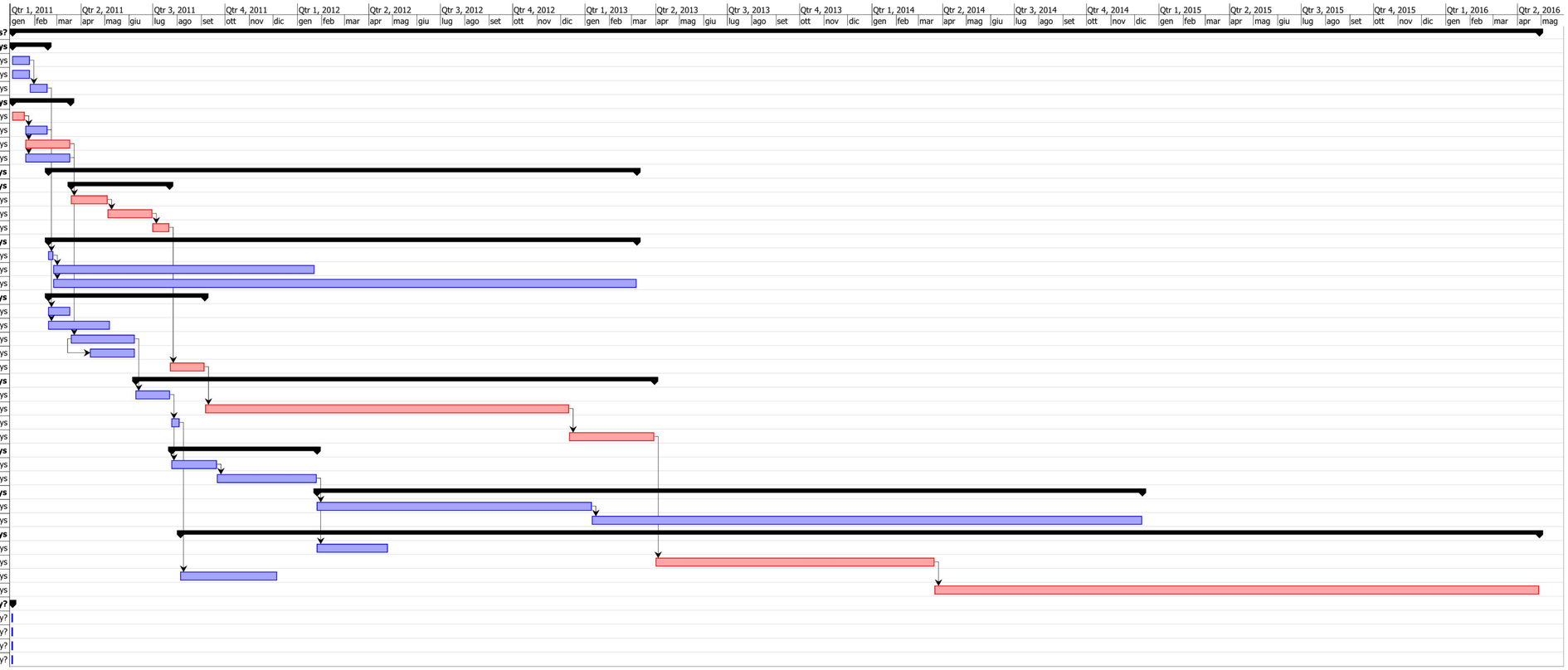

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