

TANGENZIALE EST ESTERNA DI MILANO

CODICE C.U.P. I21B05000290007
CODICE C.I.G. 017107578C

PROGETTO ESECUTIVO LOTTO B

PROGETTO ESECUTIVO DELLE CAVE DI PRESTITO

CAVA DI GHIAIA E SABBIA NEI COMUNI DI POZZUOLO MARTESANA E MELZO
STUDIO D'IMPATTO AMBIENTALE

RISPOSTA ALLE RICHIESTE DI INTEGRAZIONI MATTM

PROT. GTVA-2014-0004374 DEL 23/12/2014

ALLEGATO 4 - PMA ACQUE SOTTERRANEE POZZUOLO MARTESANA

I PROGETTISTI



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Ordine dei Geologi
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IL DIRETTORE TECNICO



Dott. Ing. Rocco Magri

PRESTAZIONI SPECIALISTICHE

Dott. Ing. Pietro Mazzoli
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n. 821

IL CONCEDENTE



IL CONCESSIONARIO

tangenziale
esterna

DIRETTORE DEI LAVORI

A	30/01/2015	EMISSIONE	CERUTTI	CALEFFI	MAZZOLI
EM./REV	DATA	DESCRIZIONE	ELABORAZIONE PROGETTUALE	CONTR.	APPROVATO

IDENTIFICAZIONE ELABORATO

NUM. PROGR.	FASE	LOTTO	ZONA	OPERA	TRATTO OPERA	AMBITO	TIPO ELABORATO	PROGRESSIVA	REV.	DATA: 30/01/2015
B7667	E	B	AB3	00000	0	CP	RT	009	A	SCALA:

Monitoraggio ambientale acque sotterranee - Comune di Pozzuolo Martesana

Stazione di indagine	Fase	Progr.	Data	Livello Statico (m)	Temperatura dell'Acqua (T) (°C)	Conducibilità Elettrica (microS/cm)	pH (unità pH)	Alluminio (Al) (microg/l)	Arsenico (As) (microg/l)	Cadmio (Cd) (microg/l)	Calcio (Ca) (mg/l)	Cloruri (Cl-) (mg/l)	Cromo Totale (Cr Tot) (microg/l)	Cromo VI (Cr VI) (microg/l)	Ferro (Fe) (microg/l)	Magnesio (Mg) (mg/l)	Manganese (Mn) (microg/l)	Nichel (Ni) (microg/l)	Nitrati (NO3-) (mg/l)	
PIM-PM-01	Ante operam	7.93 Km	06/09/11	1.1	19.00	456.00	7.46	< 5.00	0.20	< 0.05	19.90	5.00	< 0.50	< 0.50	< 5.00	11.30	< 0.50	< 0.30	11.99	
			19/10/11	3.29	18.10	455.00	7.58	< 5.00	0.60	< 0.05	23.60	4.20	3.00	< 0.50	38.00	12.10	< 0.50	< 0.30	10.58	
			03/07/12	2.49	16.00	402.00	7.24	< 5.00	1.00	< 0.05	20.20	5.60	0.60	< 0.50	< 5.00	10.40	< 0.50	< 0.30	13.10	
PIM-PM-02	Ante operam	9.2 Km	23/04/12	4.82	17.10	402.00	7.68	< 5.00	0.50	< 0.05	25.30	5.70	< 0.50	< 0.50	< 5.00	14.90	< 0.50	< 0.30	14.10	
	Corso d'opera		20/09/12	1.17	19.20	524.00	7.68	< 5.00	< 0.20	< 0.05	21.10	7.60	2.60	< 0.50	< 5.00	15.00	0.80	< 0.30	13.31	
			14/11/12	2.52	18.00	496.00	7.39	7.00	0.30	< 0.05	54.40	4.70	3.80	< 0.50	< 5.00	13.00	1.80	< 0.30	11.20	
			08/05/13	5.22	16.00	527.00	7.48	8.60	0.50	< 0.05	9.30	6.70	0.80	< 0.50	< 20.00	13.20	< 0.50	0.50	18.80	
			05/08/13	0.63	18.10	507.00	7.59	< 5.00	0.20	< 0.05	65.30	18.60	0.50	< 0.50	< 20.00	13.50	< 0.50	< 0.30	21.60	
			19/11/13	2.79	17.90	533.00	7.13	7.00	0.42	< 0.10	89.10	6.94	1.81	1.63	9.41	15.80	< 0.27	< 0.35	14.30	
18/02/14	2.49	16.20	530.00	7.43	8.62	0.40	< 0.10	82.70	5.99	0.51	< 0.19	19.40	15.60	0.50	0.30	15.70				
PIM-PM-03	Ante operam	9.8 Km	23/04/12	5.29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Corso d'opera		20/09/12	2.81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			14/11/12	3.71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PIM-PM-21	Corso d'opera	7.935 Km	29/05/13	5.71	17.30	706.00	7.17	138.90	0.60	0.07	98.40	31.10	3.90	< 0.50	296.00	18.70	80.40	0.80	22.40	
			26/09/13	3.09	18.10	487.00	7.24	5.50	0.20	< 0.05	91.80	4.00	< 0.50	< 0.50	< 20.00	15.70	1.90	0.30	12.80	
			11/12/13	6.25	17.40	488.00	7.44	6.86	0.29	< 0.10	77.80	4.60	2.09	0.58	19.70	14.00	0.27	1.48	11.00	
			30/01/14	5.41	17.00	544.00	7.39	9.92	0.35	< 0.10	87.40	6.77	0.85	0.41	15.30	16.10	0.73	0.59	16.30	
			28/05/14	4.36	16.10	594.00	7.21	5.43	0.33	< 0.07	94.20	9.96	0.34	< 0.19	10.80	16.60	0.55	0.42	30.00	
			26/08/14	1.79	16.70	514.00	7.44	3.75	0.28	< 0.07	80.50	5.79	0.42	< 0.18	4.19	15.40	0.33	< 0.36	19.00	
			20/11/14	3.59	17.10	503.00	7.39	4.56	0.25	< 0.07	81.60	5.85	0.36	0.35	20.40	13.40	< 0.25	< 0.36	14.30	
PIM-PM-23	Corso d'opera	9.8 Km	08/05/13	4.38	14.30	611.00	7.33	5.00	0.30	< 0.05	11.40	9.50	3.80	3.00	22.00	15.60	7.40	1.00	29.50	
			06/08/13	2.46	18.50	590.00	7.15	24.40	< 0.20	< 0.05	16.50	8.50	3.60	< 0.50	32.00	13.90	< 0.50	< 0.30	< 0.10	
			30/10/13	3.47	18.40	585.00	7.12	< 5.00	0.30	< 0.05	78.80	8.70	2.20	< 0.50	< 20.00	15.50	< 0.50	< 0.30	24.74	
			13/05/14	4.3	15.30	612.00	7.15	4.70	0.42	< 0.07	89.20	10.30	0.70	0.50	3.91	16.90	1.24	0.85	27.30	
			18/06/14	2.71	15.70	594.00	7.16	3.98	0.54	< 0.07	95.30	8.57	0.69	< 0.19	4.70	17.20	0.76	0.56	27.50	
			23/07/14	2.78	16.80	597.00	7.17	11.10	0.43	< 0.07	90.70	8.81	0.75	< 0.19	11.50	16.60	0.30	0.60	29.70	
			22/10/14	3.39	18.60	602.00	7.24	8.92	0.52	< 0.07	87.80	8.67	5.77	< 0.18	33.10	16.50	0.34	3.44	24.70	
PIV-PM-01	Ante operam	8.4 Km	06/09/11	1.2	18.00	603.00	7.24	10.40	0.30	< 0.05	26.80	8.90	< 0.50	< 0.50	< 5.00	14.90	4.10	0.50	24.38	
			19/10/11	2.78	17.30	603.00	7.36	< 5.00	0.90	< 0.05	31.40	8.80	4.70	< 0.50	42.00	16.00	< 0.50	0.60	23.30	
			03/07/12	2.1	16.00	459.00	7.38	< 5.00	0.90	< 0.05	23.00	9.60	0.50	< 0.50	< 5.00	11.90	1.10	< 0.30	22.50	
	Corso d'opera		29/05/13	4.6	14.70	714.00	7.20	33.10	0.50	< 0.05	96.70	16.40	4.40	< 0.50	< 0.50	101.00	17.90	7.50	< 0.30	36.00
			26/09/13	2.51	18.10	678.00	7.08	48.40	0.30	< 0.05	127.40	11.90	< 0.50	< 0.50	< 20.00	20.70	1.70	< 0.30	43.50	
			11/12/13	5.16	16.20	654.00	7.21	12.20	0.44	< 0.10	107.00	9.90	2.88	0.69	34.60	19.00	1.24	4.01	24.30	
			30/01/14	4.28	14.80	671.00	7.18	15.00	0.45	< 0.10	107.00	9.92	0.96	0.26	23.40	19.10	0.59	1.05	25.90	
			28/05/14	3.67	15.20	688.00	7.05	4.71	0.42	< 0.07	108.00	13.40	0.58	0.25	3.84	18.60	0.31	0.43	36.50	
			26/08/14	1.49	17.60	662.00	7.25	3.55	0.34	< 0.07	105.00	12.40	0.63	0.27	4.28	19.20	0.32	0.41	28.90	
			20/11/14	2.83	17.00	674.00	7.20	3.39	0.49	< 0.07	113.00	11.30	0.55	0.37	7.31	18.00	< 0.25	1.39	28.30	

Monitoraggio ambientale acque sotterranee - Comune di Pozzuolo Martesana

Stazione di indagine	Zinco (Zn) (microg/l)	Piombo (Pb) (microg/l)	Potassio (K) (mg/l)	Potenziale RedOx (mV)	Rame (Cu) (microg/l)	Sodio (Na) (mg/l)	Solfati (SO4-) (mg/l)	Ossigeno disciolto (O2) (mg/l)	Idrocarburi Totali (microg/l)	Tensioattivi Anionici (mg/l)	Tensioattivi Non Ionici (mg/l)	TOC (mg/l)
PIM-PM-01	2.10	0.40	1.90	-43.00	< 0.50	5.20	24.80	6.35	< 20.00	< 0.10	< 0.10	1.13
	< 2.00	0.70	2.00	-50.00	1.60	4.70	27.20	6.21	< 20.00	< 0.10	< 0.10	1.10
	< 2.00	< 0.20	1.70	-40.00	0.80	4.10	27.50	6.71	< 20.00	0.13	< 0.10	2.43
PIM-PM-02	< 2.00	< 0.20	1.30	-43.00	< 0.50	6.80	25.40	7.63	< 20.00	0.15	< 0.10	2.29
	< 2.00	< 0.20	3.00	-48.00	2.80	6.70	31.70	5.91	< 20.00	0.10	< 0.10	< 1.00
	< 2.00	< 0.20	1.40	-30.00	2.80	5.60	24.80	3.00	< 20.00	< 0.10	< 0.10	< 1.00
	2.80	< 0.20	1.80	-37.00	1.60	5.80	30.00	6.60	< 20.00	< 0.10	< 0.10	2.16
	< 2.00	< 0.20	1.60	-48.60	4.70	5.60	28.40	8.57	< 20.00	< 0.10	< 0.10	1.40
	63.20	< 0.23	1.66	-9.00	1.13	8.15	27.30	4.95	< 8.94	< 0.07	< 0.06	1.52
8.88	0.23	1.61	-32.20	0.99	7.08	22.50	7.24	65.90	< 0.05	< 0.02	1.09	
PIM-PM-03	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
PIM-PM-21	< 2.00	9.10	1.80	-23.00	2.70	7.50	39.30	31.20	< 20.00	< 0.10	< 0.10	4.29
	21.10	0.20	1.90	-16.00	5.70	8.40	24.10	3.55	< 20.00	< 0.10	< 0.10	< 1.00
	4.94	0.21	1.88	-24.30	1.57	6.09	22.50	5.09	< 8.94	< 0.07	< 0.06	0.46
	7.11	0.16	2.10	-29.90	1.12	6.94	22.80	5.49	< 8.94	< 0.07	< 0.06	2.09
	5.55	< 0.24	2.04	-26.90	< 0.46	6.96	24.70	6.35	< 20.40	< 0.05	< 0.02	0.43
	6.91	< 0.24	1.88	-17.00	0.47	6.48	24.60	6.75	< 20.40	< 0.05	< 0.02	0.97
2.85	< 0.24	1.86	-25.00	0.52	5.41	23.00	6.09	< 20.40	< 0.05	< 0.02	1.50	
PIM-PM-23	< 2.00	< 0.20	1.50	-29.00	1.80	7.00	30.30	3.10	< 20.00	< 0.10	< 0.10	1.94
	< 2.00	< 0.20	1.20	-28.60	2.50	7.00	24.90	6.32	< 20.00	< 0.10	< 0.10	1.10
	2.70	< 0.20	1.50	-6.00	16.50	6.90	26.30	4.00	< 20.00	< 0.10	< 0.10	1.20
	4.09	< 0.24	1.83	-21.20	1.57	8.36	25.40	5.03	< 20.40	< 0.05	< 0.02	0.73
	2.97	< 0.24	1.68	-24.30	0.52	8.64	26.50	4.90	< 20.40	< 0.05	< 0.02	0.89
	12.80	4.53	1.76	-21.20	0.50	8.09	25.90	5.36	< 20.40	< 0.05	< 0.02	0.62
2.53	< 0.24	1.91	-16.30	0.54	7.53	24.90	3.80	< 20.40	< 0.05	< 0.02	1.18	
PIV-PM-01	< 2.00	0.40	2.20	-31.00	< 0.50	7.60	27.60	4.49	< 20.00	< 0.10	< 0.10	1.69
	2.10	0.60	2.20	-37.00	1.20	7.50	29.90	7.99	< 20.00	< 0.10	< 0.10	1.30
	< 2.00	< 0.20	1.90	-43.00	0.80	6.30	29.80	7.71	< 20.00	0.14	< 0.10	2.70
	< 2.00	0.30	1.80	-23.00	1.60	8.50	29.70	7.31	< 20.00	< 0.10	< 0.10	4.45
	20.10	0.60	2.20	-6.00	4.10	10.90	28.70	4.62	< 20.00	< 0.10	< 0.10	1.20
	7.98	0.32	2.26	-11.50	2.54	9.69	25.10	4.57	< 8.94	< 0.07	< 0.06	0.82
	11.30	0.23	2.32	-18.10	1.28	10.20	24.10	6.17	< 8.94	< 0.07	< 0.06	2.86
	3.50	< 0.24	2.29	-18.20	0.51	9.96	27.20	6.56	< 20.40	< 0.05	< 0.02	0.43
	4.67	< 0.24	2.34	-6.20	0.60	9.58	27.50	4.60	< 20.40	< 0.05	< 0.02	1.49
2.29	< 0.24	2.31	-14.80	0.57	8.94	27.80	4.65	< 20.40	< 0.05	< 0.02	1.85	