

Tabbin Institute for Metallurgical Studies

Energy and Environment Research Center

E2RC

ISO 9001 -2008

**Report on
Environmental State
for
Worley Parsons Engineers Egypt
El Ain El Soukhna**

August, 2014

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● ***Introduction***

According to the Contract between **WorleyParsons Engineers Egypt Ltd.** and **Energy&Environmental Research Center (E2RC)**, **Tabbin Institute for metallurgical studies (TIMS)** to execute ambient air quality environmental measurements in *El Ain El Soukhna area* location field, the following measurements were conducted during 13-14 August 2014.

● ***Measurements:***

1. Total Suspended Particulate (TSP)
2. Thoracic particulate (PM10)
3. Thoracic particulate (PM2.5)
4. Concentration of Lead (Pb)
5. Gaseous Air pollutants.
 - Nitrogen dioxide NO₂.
 - Sulfur dioxide SO₂.
 - Carbon monoxide CO.
 - Ozone (O₃)
6. Ammonia
7. Hydrogen Sulfide
8. Concentration of BTX (Benzene, Toluene, Xylene).
9. Ethyl Acetate
10. Weather Station (WR, WS , WD , AT , BP , RH & Gust)



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Energy and Environment Research Center (E2RC)**

• ***Methods of measurements and the Used Equipment***

- **Ambient Air quality Monitoring Station includes :**

1- Total Suspended Particulate (TSP)

High Volume Sampler- GMW – USA

EPA method, Appendix J-Reference method FR

**2- Suspended Particulate Monitor FH 62 C14 on – Line
(PM₁₀ & PM 2.5)**

Principle of measurements:-

The FH 62 C14 – on – line Particulate Monitor is the only beta attenuation gauge (using a C – 14 source) measuring the growing particle mass during sampling .this mode of operation permits a real measurements and an on – line output of the mass concentration of the suspended particulate in ambient air.

**3- Atomic Absorption spectrophotometer Analyst 400 for
Pb – Reference Method SM3500 B Pb**

4- NO – NO₂ – NO_x Analyzer - Model 42i- USA

5- Carbon Monoxide (CO) Analyzer model 48i-USA

6- Sulfur Dioxide (SO₂) Analyzer model 43i-USA

7- Ozone (O₃) analyzer model 49i-USA

8- Calibration Cylinders for (NO , CO & SO₂)-USA

9- Two Units for Zero air and Span Calibration

models 111 & 145i-USA

10- Concentration of Ammonia (NH₃), H₂S, BTX & Ethyl Acetate.

Portable Ambient air analyzer – Miran Sapphire - USA

11- Weather Station (WS , WD , AT , RH , BP & Gust)



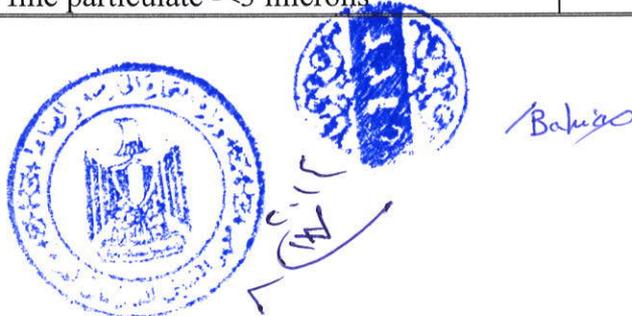
TABBIN Institute for Metallurgical Studies (TIMS)
Energy and Environment Research Center (E2RC)

3 Air Quality And Health Effects Of Air Pollution

The adverse human health effects attributable to air pollution include acute effects as well as chronic effects caused by exposure to lower concentrations for long periods. Air pollution is either gaseous or particulate. Common air pollutants are carbon monoxide, sulfur dioxide, nitrogen oxides, ozone and particulate matters. Air pollutants in workplaces are greatly varied according to the industrial process in the site of exposure. The following table shows the effects of common air pollutants on human health

Common Air Pollutants and Their Health Effects

Air pollutant	Main Characteristic	Principal Health Effects
Carbon monoxide (CO)	Colorless, odorless gas with strong affinity to hemoglobin in blood.	Absorbed by lungs; impairs physical and mental capacities; affects fetal development; aggravates cardiovascular disease.
Sulfur dioxide (SO ₂)	Colorless gas with pungent odor; oxidizes to form sulfur trioxide (SO ₃) and sulfuric acid with water	Classed as mild respiratory irritant; major cause of acid rain.
Nitrogen dioxide (NO ₂)	Reddish-brown	Major role as component is creating a photochemical smog; evidence linking respiratory problems and cardiovascular illnesses
Ozone (O ₃)	Colorless gas	Sensory and respiratory irritations plant damage provides indirectly, an index of visibility reduction due to photochemical aerosols, possible adverse effects on health.
Particulate matter	Any solid or liquid particles dispersed in the atmosphere, such as dust, ash, soot, metals, and various chemicals; often classified by diameter size- particles (>50microns), aerosols (<50 microns), fine particulate -<3 microns	Toxic effects or aggravation of the effects of gaseous pollution; aggravation of respiratory or cardio respiratory symptoms



*Measurements of Ambient
Air Quality
Active Air (1)*



Results and Discussion

Measurements of air contaminants were conducted in the El Ain El Soukhna area. Results of ambient air (TSP, PM₁₀, PM_{2.5}, Black Smoke, Pb, CO, NO₂, SO₂, O₃, NH₃, H₂S, BTX "Benzene, Toluene, Xylene" and Ethyl Acetate) according to 24 hours were summarized and compared with the maximum allowable limits according to law 4/1994. These results are less than Maximum permissible limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments issued no 710 in 2012.

▪ *Thoracic Particulates measurements (TSP, PM₁₀, PM_{2.5}, Black Smoke & Pb):*

Measurements of TSP, PM₁₀, PM_{2.5}, Black Smoke and Pb were carried out for 24-hour periods. A summary of these pollutants presented in table (1), these data shows that the concentration of TSP, PM₁₀, PM_{2.5} and Black Smoke are less than the Maximum permissible limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments issued no. 710 in 2012.

▪ *Gaseous air pollutants:*

Measured gaseous pollutants are NO₂, CO, O₃ and SO₂. Table (2) shows the concentrations of gaseous pollutants. These measurements show that the average concentrations were less than Maximum permissible limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments issued no. 710 in 2012.

▪ *Concentration of Ammonia & Hydrogen Sulfide :*

Measured gaseous pollutants are Ammonia and Hydrogen Sulfide. Table (3) shows the concentrations of gaseous pollutants. These measurements show that the average concentrations were less than Maximum permissible limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments issued no. 710 in 2012.

▪ *Concentration of BTX & Ethyl Acetate :*

Measured gaseous pollutants are BTX (Benzene, Toluene and Xylene) and Ethyl Acetate. Table (4) shows the concentrations of gaseous pollutants. These measurements show that the average concentrations were less than the maximum permissible limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments issued no. 710 in 2012.



Table (1)
24 hour Concentration the Particulates
(TSP, PM10, PM2.5, Black Smoke and Pb)

Company Name: WorleyParsons Engineers Egypt Ltd.
Location of measurements: El Ain El Soukhna area field (Active air -1)
Date of measurement : 13 – 14/08/2014

Sampling site	Concentration (ug/m ³)				
	TSP	PM10	PM2.5	Black Smoke	Pb
Active air (1)	102	76	19.5	35	(UD)*
(**)	230	150	80	150	--

UD: Undetectable limit

(*) Minimum limit of atomic absorption for Pb = $1 \cdot 10^{-5}$

(**) Environmental Law no 4/1994 and its executive regulations No. 710/2012



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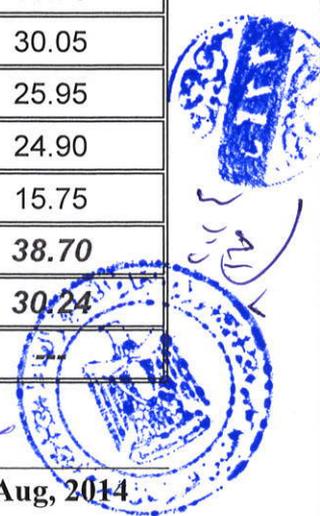
Table (2)

Concentrations of gaseous air pollutants

Company Name: WorleyParsons Engineers Egypt Ltd.
Location of measurements: El Ain El Soukhna area field (Active air -1)
Date of measurement : 13 – 14/08/2014

Time	NO ₂ ug/m ³	SO ₂ ug/m ³	CO mg/m ³	O ₃ ug/m ³
13/08/2014 01:00	5.24	0.90	0.86	14.60
02:00	4.92	0.38	0.17	17.70
03:00	6.81	0.08	0.00	14.95
04:00	2.51	0.00	0.00	9.25
05:00	3.72	0.00	0.00	10.35
06:00	4.45	0.00	0.00	10.55
07:00	6.60	0.00	0.17	6.00
08:00	7.43	0.00	0.00	6.30
09:00	7.38	0.00	0.17	10.05
10:00	6.28	0.00	0.34	15.00
11:00	5.03	0.00	0.17	18.45
12:00	3.51	0.00	0.26	23.95
13:00	2.57	0.00	0.34	27.60
14:00	2.83	0.56	0.17	31.20
15:00	2.77	0.56	0.17	34.25
16:00	3.04	0.45	0.00	27.75
17:00	2.72	0.60	0.00	35.90
18:00	2.57	0.34	0.00	35.40
19:00	2.04	0.23	0.00	35.25
20:00	0.68	0.00	0.00	38.70
21:00	0.89	0.00	0.00	30.05
22:00	0.94	0.00	0.00	25.95
23:00	1.57	0.00	0.00	24.90
14/08/2014 00:00	1.47	0.04	0.00	15.75
Max. 1h	7.43	0.90	0.86	38.70
Max.-8h	---	---	0.20	30.24
Avg.-24h	3.66	0.17	---	

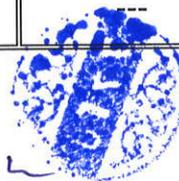
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The limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments issued no.710 in 2012.

Time	NO ₂	SO ₂	CO	O ₃
Max. 1h	300 ug/m ³ 0.2ppm	350 ug/m ³ 0.1337 ppm	30 mg/m ³ 26 ppm	180 ug/m ³ 0.352 ppm
Max.-8h	---	---	10 mg/m ³ 9ppm	120 ug/m ³ 0.253 ppm
Avg.-24h	150ug/m ³ 0.08ppm	150 ug/m ³ 0.0573 ppm	---	---



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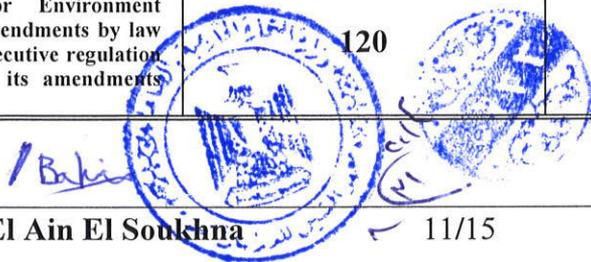
**TABBIN Institute for Metallurgical Studies (TIMS)
Energy and Environment Research Center (E2RC)**

Table (3)

Average Concentrations of Pollutant Gases (ppm)

Company Name: WorleyParsons Engineers Egypt Ltd.
Location of measurements: El Ain El Soukhna area field (Active air -1)
Date of measurement : 13 – 14/08/2014

Time	Ammonia ug/m ³	Hydrogen Sulfide ppm
13/08/2014 01:00	Nil	Nil
02:00	Nil	Nil
03:00	Nil	Nil
04:00	Nil	Nil
05:00	Nil	Nil
06:00	Nil	Nil
07:00	Nil	Nil
08:00	Nil	Nil
09:00	Nil	Nil
10:00	Nil	Nil
11:00	Nil	Nil
12:00	Nil	Nil
13:00	Nil	Nil
14:00	Nil	Nil
15:00	Nil	Nil
16:00	Nil	Nil
17:00	Nil	Nil
18:00	Nil	Nil
19:00	Nil	Nil
20:00	Nil	Nil
21:00	Nil	Nil
22:00	Nil	Nil
23:00	Nil	Nil
14/08/2014 00:00	Nil	Nil
Max. 1h	Nil	Nil
Max.-8h	Nil	Nil
Avg.-24h	Nil	Nil
Maximum permissible limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments issued in 2012.	120	---

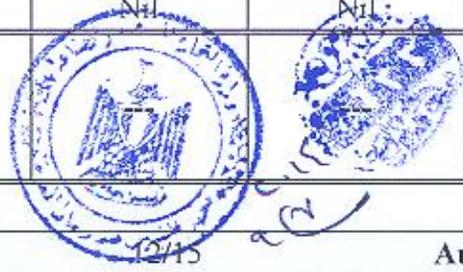


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**Table (4)
Average Concentrations of Pollutant Gases (ppm)**

Company Name: WorleyParsons Engineers Egypt Ltd.
Location of measurements: El Ain El Soukhna area field (Active air -1)
Date of measurement : 13 – 14/08/2014

Time	BTX			Ethyl Acetate
	Benzene	Toluene	Xylene	
13/08/2014 01:00	Nil	Nil	Nil	Nil
02:00	Nil	Nil	Nil	Nil
03:00	Nil	Nil	Nil	Nil
04:00	Nil	Nil	Nil	Nil
05:00	Nil	Nil	Nil	Nil
06:00	Nil	Nil	Nil	Nil
07:00	Nil	Nil	Nil	Nil
08:00	Nil	Nil	Nil	Nil
09:00	Nil	Nil	Nil	Nil
10:00	Nil	Nil	Nil	Nil
11:00	Nil	Nil	Nil	Nil
12:00	Nil	Nil	Nil	Nil
13:00	Nil	Nil	Nil	Nil
14:00	Nil	Nil	Nil	Nil
15:00	Nil	Nil	Nil	Nil
16:00	Nil	Nil	Nil	Nil
17:00	Nil	Nil	Nil	Nil
18:00	Nil	Nil	Nil	Nil
19:00	Nil	Nil	Nil	Nil
20:00	Nil	Nil	Nil	Nil
21:00	Nil	Nil	Nil	Nil
22:00	Nil	Nil	Nil	Nil
23:00	Nil	Nil	Nil	Nil
14/08/2014 00:00	Nil	Nil	Nil	Nil
Max. 1h	Nil	Nil	Nil	Nil
Max.-8h	Nil	Nil	Nil	Nil
Avg.-24h	Nil	Nil	Nil	Nil
Maximum permissible limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments issued in 2012.	---	---	---	---

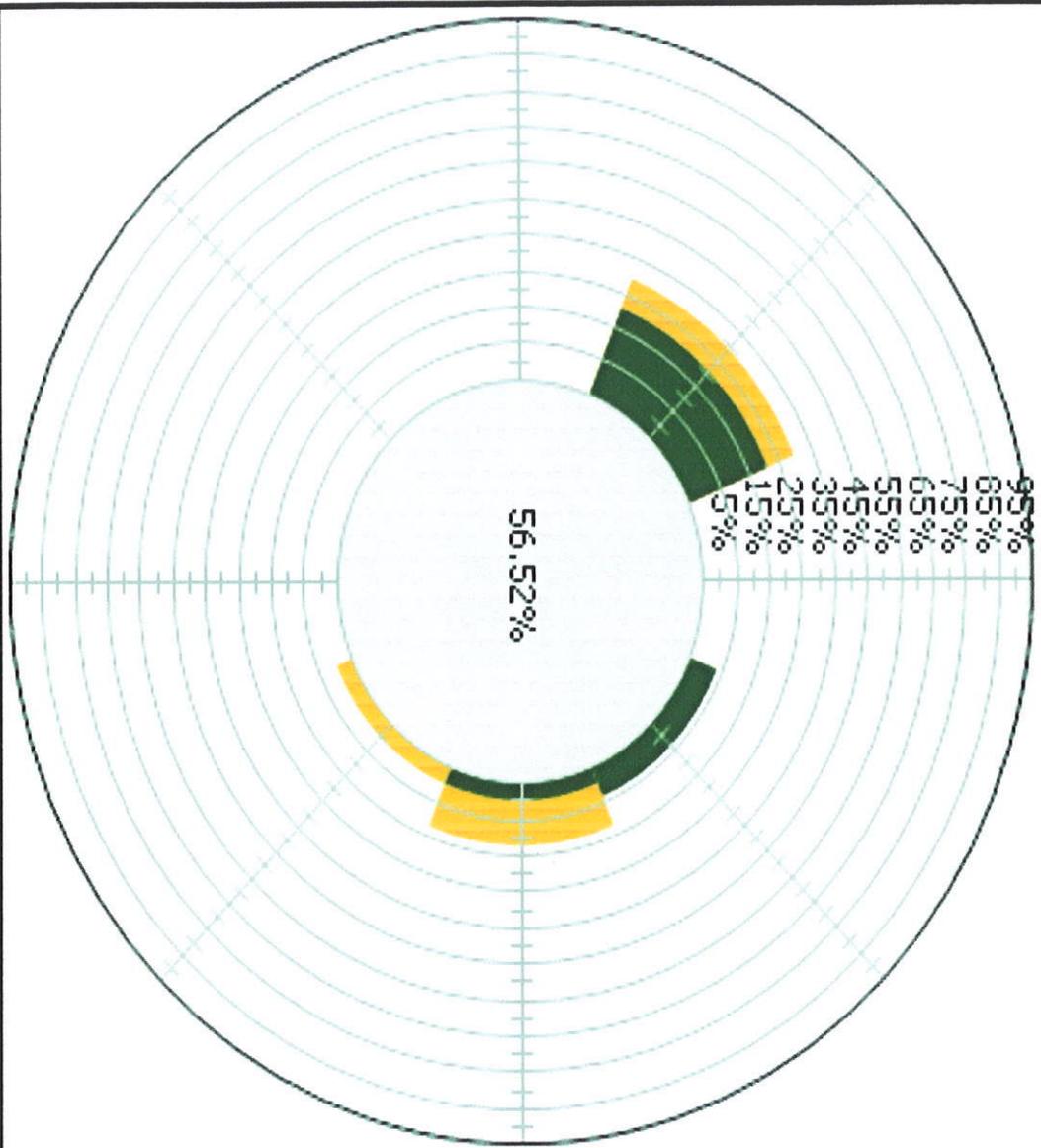


*Weather Station data at
Active Air (1)
(WS , WD , RH , BP, AT and Gust)*



Handwritten signature in blue ink, appearing to read "Bahies".

Wind Rose [TEBINST]



>10.00	0.000%
10.00	0.000%
8.00	26.09%
4.00	17.39%
2.50	0.000%
<=2.00	56.52%

Data Period :
 From : 8/13/2014 01:00
 To : 8/14/2014 00:00
 Data Source : Hourly
 W.Dir : WD (DEG)
 W.Speed : WS (M/SEC)
 Total Records: 24
 Valid Records: 24



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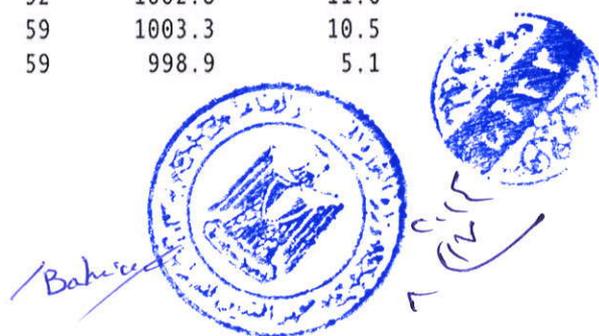
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Hourly Report

Print : 14/08/2014

Page : 1

Date Time	WS (M/SEC)	WD (DEG)	AT (DEG C)	RH (%RH)	BP (Mbar)	GUST (M/SEC)	Status
08/13 01	1.5	284	28.1	65	1000.7	5.5	
08/13 03	1.0	28	28.2	66	1003.3	4.6	
08/13 04	1.1	301	26.6	73	1001.2	4.8	
08/13 05	0.8	303	26.2	75	1003.0	3.0	
08/13 06	0.7	251	25.2	77	1003.2	1.8	
08/13 07	1.1	233	25.0	76	1003.5	2.8	
08/13 08	0.7	225	28.9	55	1003.7	1.8	
08/13 09	0.6	324	33.7	37	1003.7	2.7	
08/13 10	0.8	276	35.3	31	1003.5	2.6	
08/13 11	1.1	278	34.6	25	996.7	4.1	
08/13 12	1.4	352	35.9	24	1002.8	4.9	
08/13 13	1.7	214	36.7	22	1000.5	6.2	
08/13 14	4.5	76	34.6	25	995.8	7.9	
08/13 15	3.2	80	36.7	24	1001.3	7.5	
08/13 16	5.7	96	37.0	21	1000.8	9.8	
08/13 17	6.3	93	36.7	22	1000.6	9.8	
08/13 18	5.2	118	36.6	23	1000.4	8.6	
08/13 19	4.0	24	37.6	20	1000.5	8.2	
08/13 20	4.8	334	35.8	28	1001.0	11.7	
08/13 21	3.8	308	33.9	40	1001.8	11.5	
08/13 22	4.0	317	32.2	52	1002.8	11.6	
08/13 23	4.1	323	30.9	59	1003.3	10.5	
08/14 00	1.1	305	29.1	59	998.9	5.1	



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**Air Quality Monitoring Report
for
Worly Parsons Engineers Egypt
El Ain El Soukhna**

November, 2014

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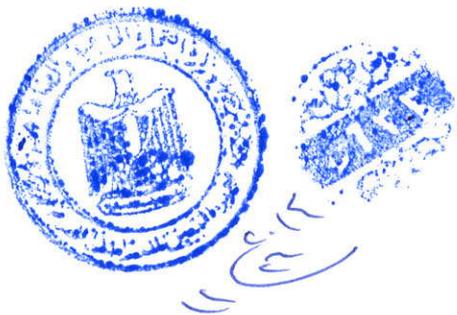


Team Work

From TIMS

Dr. Tarek Mahmoud Sami	TIMS Director
Prof. Dr. Attia Saad El-Din	E2RC Executive Directory
Chem. Samir Hammad	General Manager of Central Lab.
Chem. Ragab Abd El khalek	Head of Air Pollution Monitoring and research Lab.
Chem. Hossam Ahmed Elmotily	Air Pollution Specialist

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- ***Introduction***

According to the request of **WorleyParsons Engineers Egypt Ltd.** and **Energy&Environmental Research Center (E2RC)**, **Tabbin Institute for metallurgical studies (TIMS)** to conduct the ambient air quality measurements in *El Ain El Soukhna area* location field, the following measurements were conducted during 12-13 November 2014.

- ***Assigned Locations:***

The following location is assigned by Company:

- *Active Area 1 (Beside El-Wadi Village)*

- ***Measurements:***

1. Total Suspended Particulate (TSP)
2. Thoracic particulate (PM10)
3. Fine particulate (PM2.5)
4. Lead (Pb)
5. Gaseous Air pollutants.
 - Nitrogen dioxide NO₂.
 - Sulfur dioxide SO₂.
 - Carbon monoxide CO.
 - Ozone (O₃)
 - Ammonia
 - Hydrogen Sulfide
 - Ethyl Acetate
 - BTX (Benzene, Toluene, Xylene)
6. Weather elements (WR, WS , WD , AT , BP , RH & Gust)



• **Used Equipment and Methods of measurements**

1- Total Suspended Particulate (TSP)

- High Volume Sampler- GMW – USA
- EPA method, Appendix J-Reference method FR

2- Thoracic particulate (PM10)

- High Volume Sampler- GMW – USA
- EPA method, Appendix J-Reference method FR

3- Fine particulate (PM2.5)

- Particulate Monitor FH 62 C14
- The FH 62 C14 – on – line Particulate Monitor is the only beta attenuation gauge (using a C – 14 source) measuring the growing particle mass during sampling .this mode of operation permits a real measurements and an on – line output of the mass concentration of the suspended particulate in ambient air.

4- Lead (Pb)

- Atomic Absorption Spectrophotometer Analyzer 400 for Pb – Reference Method SM3500 B Pb
- Filter paper for TSP sampling were analyzed using Atomic Absorption spectrophotometer

5- NO – NO₂ – NO_x Analyzer - Model 42i- USA

6- Carbon Monoxide (CO) Analyzer model 48i-USA

7- Sulfur Dioxide (SO₂) Analyzer model 43i-USA

8- Ozone (O₃) analyzer model 49i-USA

9- Ammonia (NH₃), Hydrogen Sulfide (H₂S), BTX & Ethyl Acetate were measured using Portable Ambient air analyzer – Miran Sapphire - USA

10- Weather(WS , WD , AT , RH , BP & Gust)

11- Calibration tools for calibration of the used equipments :

- a. Calibration Cylinders for (NO , CO & SO₂)-USA
- b. Zero air unit models 111 - USA
- c. Span Calibration unit 145i - USA



3 Air Quality And Health Effects Of Air Pollution

The adverse human health effects attributable to air pollution include acute effects as well as chronic effects caused by exposure to lower concentrations for long periods. Air pollution is either gaseous or particulate. Common air pollutants are carbon monoxide, sulfur dioxide, nitrogen oxides, ozone and particulate matters. Air pollutants in workplaces are greatly varied according to the industrial process in the site of exposure. The following table shows the effects of common air pollutants on human health

Common Air Pollutants and Their Health Effects

Air pollutant	Main Characteristic	Principal Health Effects
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Sulfur dioxide (SO ₂)	Colorless gas with pungent odor; oxidizes to form sulfur trioxide (SO ₃) and sulfuric acid with water	Classed as mild respiratory irritant; major cause of acid rain.
Nitrogen dioxide (NO ₂)	Reddish-brown	Major role as component is creating a photochemical smog; evidence linking respiratory problems and cardiovascular illnesses
Ozone (O ₃)	Colorless gas	Sensory and respiratory irritations plant damage provides indirectly, an index of visibility reduction due to photochemical aerosols, possible adverse effects on health.
Particulate matter	Any solid or liquid particles dispersed in the atmosphere, such as dust, ash, soot, metals, and various chemicals; often classified by diameter size- particles (>50microns), aerosols (<50 microns), fine particulate -<3 microns	Toxic effects or aggravation of the effects of gaseous pollution; aggravation of respiratory or cardio respiratory symptoms



Measurements of Ambient Air Quality Active Area (1)

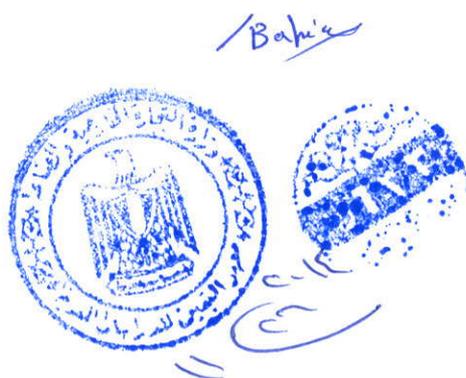


Table (1)
Average 24 hour Concentrations of
(TSP, PM10, PM2.5 and Pb)

Company Name: WorleyParsons Engineers Egypt Ltd.

Location of measurements: (Active Area -1)

Data Period: from 12/11/2014 15:00

To 13/11/2014 14:00

Duration of measurement : 24 hours

Sampling site	Concentration (ug/m ³)			
	TSP	PM10	PM2.5	Pb
Active air (1)	218	123	20	0.033
Allowable limits according to environmental law no 4/1994 and its executive regulations No. 710/2012	230	150	80	150



Table (2-1)
Concentrations of gaseous air pollutants
(NO₂, SO₂, CO and O₃)

Company Name: WorleyParsons Engineers Egypt Ltd.

Location of measurements: (Active Area -1)

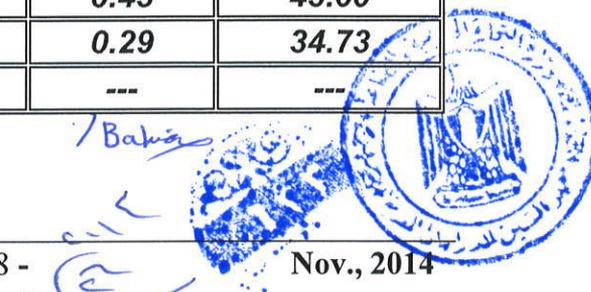
Data Period: from 12/11/2014 15:00

To 13/11/2014 14:00

Duration of measurement : 24 hours

Time	NO ₂ ug/m3	SO ₂ ug/m3	CO mg/m3	O ₃ ug/m3
12/11/2014 15:00	3.93	1.13	0.09	42.00
16:00	4.45	1.09	0.09	40.60
17:00	0.84	0.94	0.26	29.60
18:00	9.16	1.02	0.43	26.15
19:00	19.27	0.94	0.34	20.40
20:00	24.61	1.09	0.34	12.60
21:00	5.81	0.56	0.26	24.65
22:00	6.81	0.41	0.26	27.70
23:00	7.80	0.94	0.34	23.35
13/11/2014 00:00	12.41	0.75	0.34	19.25
01:00	11.31	0.49	0.26	20.10
02:00	15.86	0.49	0.26	15.15
03:00	8.17	0.26	0.26	19.75
04:00	10.84	0.68	0.26	18.00
05:00	9.74	0.34	0.26	18.00
06:00	19.74	1.39	0.34	12.65
07:00	23.14	2.22	0.26	13.70
08:00	12.15	1.73	0.26	27.10
09:00	4.97	1.95	0.26	33.80
10:00	2.51	1.99	0.26	37.90
11:00	4.97	1.95	0.26	38.85
12:00	5.97	1.92	0.17	40.95
13:00	4.87	1.47	0.17	42.50
14:00	4.61	1.47	0.17	43.00
Max. 1h	24.61	2.22	0.43	43.00
Max.-8h	---	---	0.29	34.73
Avg.-24h	9.75	1.13	---	---

For allowable limits see table (2-2)



*Table (2-2)
Allowable limits**

Time	NO ₂	SO ₂	CO	O ₃
Max. 1h	300 ug/m ³	350 ug/m ³	30 mg/m ³	180 ug/m ³
Max.-8h	---	---	10 mg/m ³	120 ug/m ³
Avg.-24h	150ug/m ³	150 ug/m ³	---	---

** The limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments issued no.710 in 2012.*

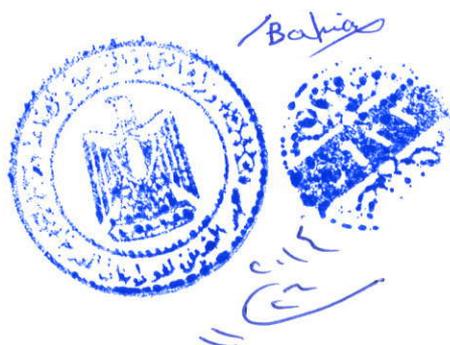


Table (3)

Concentrations of gaseous air pollutants
(NH₃ and H₂S)

Company Name: WorleyParsons Engineers Egypt Ltd.

Location of measurements: (Active Area -1)

Data Period: from 12/11/2014 15:00

To 13/11/2014 14:00

Duration of measurement : 24 hours

Time	Ammonia ug/m ³	Hydrogen sulfide ppm
12/11/2014 15:00	Nil	Nil
16:00	Nil	Nil
17:00	Nil	Nil
18:00	Nil	Nil
19:00	Nil	Nil
20:00	Nil	Nil
21:00	Nil	Nil
22:00	Nil	Nil
23:00	Nil	Nil
13/11/2014 00:00	Nil	Nil
01:00	Nil	Nil
02:00	Nil	Nil
03:00	Nil	Nil
04:00	Nil	Nil
05:00	Nil	Nil
06:00	Nil	Nil
07:00	Nil	Nil
08:00	Nil	Nil
09:00	Nil	Nil
10:00	Nil	Nil
11:00	Nil	Nil
12:00	Nil	Nil
13:00	Nil	Nil
14:00	Nil	Nil
Avg.-24h	Nil	Nil
Maximum permissible limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments issued in 2012.	120	

Bahier

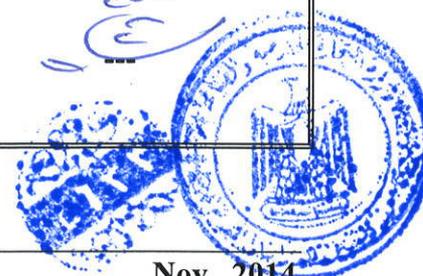


Table (4)

**Concentrations of gaseous air pollutants
(BTX and Ethyl Acetate)**

Company Name: WorleyParsons Engineers Egypt Ltd.

Location of measurements: (Active Area -1)

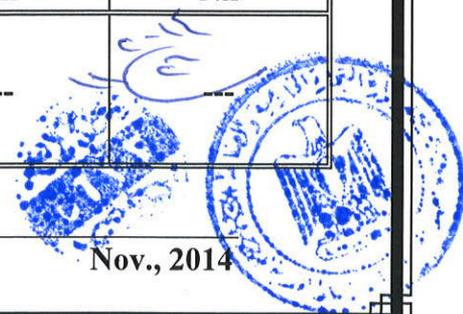
Data Period: from 12/11/2014 15:00

To 13/11/2014 14:00

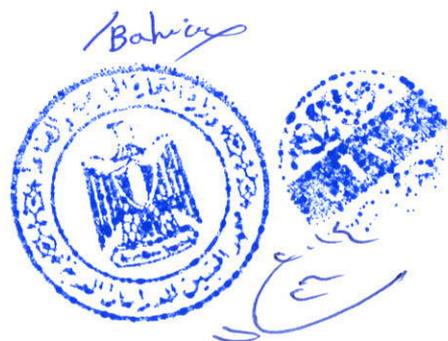
Duration of measurement : 24 hours

Time	BTX			Ethyl Acetate
	Benzene	Toluene	Xylene	
12/11/2014 15:00	Nil	Nil	Nil	Nil
16:00	Nil	Nil	Nil	Nil
17:00	Nil	Nil	Nil	Nil
18:00	Nil	Nil	Nil	Nil
19:00	Nil	Nil	Nil	Nil
20:00	Nil	Nil	Nil	Nil
21:00	Nil	Nil	Nil	Nil
22:00	Nil	Nil	Nil	Nil
23:00	Nil	Nil	Nil	Nil
13/11/2014 00:00	Nil	Nil	Nil	Nil
01:00	Nil	Nil	Nil	Nil
02:00	Nil	Nil	Nil	Nil
03:00	Nil	Nil	Nil	Nil
04:00	Nil	Nil	Nil	Nil
05:00	Nil	Nil	Nil	Nil
06:00	Nil	Nil	Nil	Nil
07:00	Nil	Nil	Nil	Nil
08:00	Nil	Nil	Nil	Nil
09:00	Nil	Nil	Nil	Nil
10:00	Nil	Nil	Nil	Nil
11:00	Nil	Nil	Nil	Nil
12:00	Nil	Nil	Nil	Nil
13:00	Nil	Nil	Nil	Nil
14:00	Nil	Nil	Nil	Nil
Avg.-24h	Nil	Nil	Nil	Nil
Maximum permissible limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments issued in 2012.	---	---	---	---

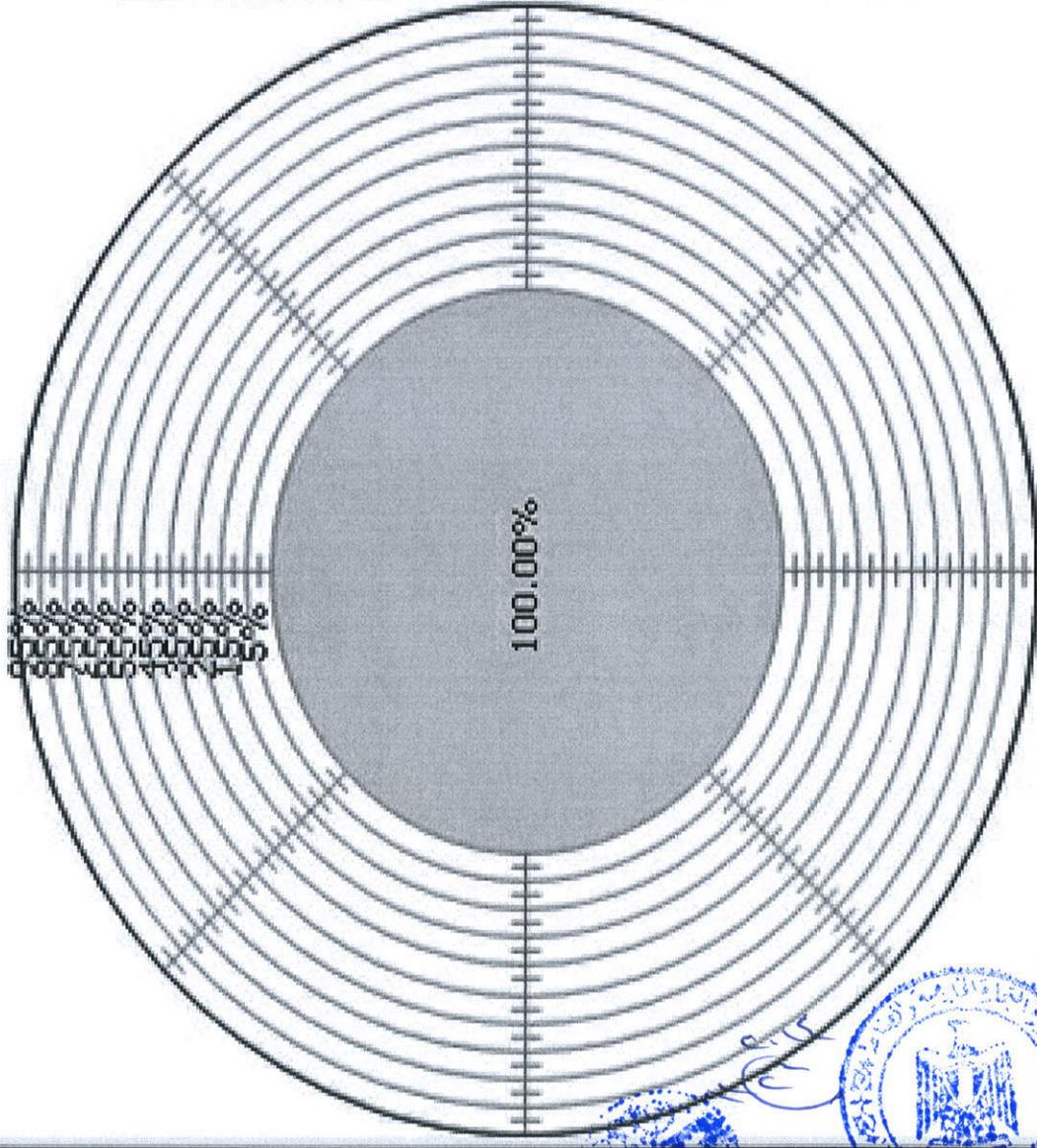
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*Weather Station data at
Active Air (1)
(WS , WD , RH , BP, AT and Gust)*



Wind Rose [TEBINST]



>10.00	0.00%
10.00	0.00%
8.00	0.00%
4.00	0.00%
2.50	0.00%
<=2.00	100.00%

Data Period :
 From : 11/12/2014 15:00
 To : 11/13/2014 14:00
 Data Source : Hourly
 W.Dir : WD (DEG)
 W.Speed: WS (M/SEC)
 Total Records: 24
 Valid Records: 24

Bahig

TEBINST

Hourly Report

Print : 11/13/2014

Page : 1

Date Time	WS (M/SEC)	WD (DEG)	AT (DEG C)	RH (%RH)	BP (Mbar)	GUST (M/SEC)	Status
11/12 15	1.4	80	26.7	41	1011.0	3.5	
11/12 16	1.0	84	25.8	45	1011.0	2.7	
11/12 17	1.3	56	24.7	50	1011.0	3.7	
11/12 18	1.0	65	23.7	51	1011.5	2.5	
11/12 19	0.4	138	22.7	53	1012.1	1.6	
11/12 20	0.3	203	20.8	59	1012.6	0.9	
11/12 21	0.2	251	19.5	65	1013.0	1.3	
11/12 22	0.5	225	20.4	71	1013.4	1.3	
11/12 23	0.5	142	19.9	75	1013.4	1.6	
11/13 00	0.4	160	19.3	79	1013.1	1.4	
11/13 01	0.3	244	18.1	83	1013.0	1.1	
11/13 02	0.2	241	17.6	85	1013.1	1.1	
11/13 03	0.3	255	16.7	87	1012.8	0.9	
11/13 04	0.3	268	16.7	89	1012.6	1.0	
11/13 05	0.3	263	16.8	88	1012.3	1.3	
11/13 06	0.3	246	16.6	88	1012.7	1.0	
11/13 07	0.3	271	16.4	90	1012.7	0.9	
11/13 08	0.3	232	20.8	72	1012.4	1.2	
11/13 09	0.6	144	25.7	46	1012.3	2.1	
11/13 10	1.1	75	24.1	52	1012.0	3.2	
11/13 11	1.3	63	24.3	49	1011.6	2.9	
11/13 12	0.6	213	29.4	34	1011.1	2.1	
11/13 13	0.6	254	31.2	28	1010.4	2.2	
11/13 14	0.6	243	32.2	25	1009.7	2.7	



Conclusion

Measurements of air contaminants were conducted in the **El Ain El Soukhna** area. Results of ambient air (TSP, PM10, PM2.5, Pb, CO, NO₂, SO₂, O₃, NH₃, H₂S, BTX "Benzene, Toluene, Xylene" and Ethyl Acetate). According to 24-hour concentrations were summarized and compared with the maximum allowable limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments no. 710 in 2012.

▪ **Particulate measurements (TSP, PM10 and PM2.5):**

Measurements of **TSP, PM10 & PM2.5** were carried out for 24-hour periods. Summary of these results are presented in table (1). Data show that the concentration of TSP, PM10 and PM2.5 are compared with the maximum allowable limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments no. 710 in 2012.

Note: The range of the average concentration of TSP in the Ain Sokhna area, according to reports submitted in advance from 102 to 232 µg/m³

▪ **Lead (Pb):**

Measurements of Lead (Pb) were carried out for 24-hour periods. Summary of these results are presented in table (1). Data show that the concentration of Lead (Pb) are compared with the maximum allowable limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments no. 710 in 2012.

▪ **Gaseous air pollutants:**

Table (2-1) shows the concentrations of **NO₂, CO, O₃ and SO₂**. These measurements show that the average 24-hour concentrations were less than maximum permissible limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments issued no. 710 in 2012.

Table (3) shows the concentrations of **NH₃ & H₂S**. These measurements show that the average 24-hour concentrations of Ammonia were less than maximum permissible limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments issued no. 710 in 2012.

Table (4) shows the concentrations of **BTX (Benzene, Toluene and Xylene) and Ethyl Acetate**. These measurements show that the average concentrations were less than the maximum permissible limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments issued no. 710 in 2012.

