



**CORPORACION AUTONOMA REGIONAL DEL MAGDALENA**  
**NIT. 800.099.287-4**

## **INFORME MENSUAL DE RESULTADOS** **RED DE MONITOREO CALIDAD DE AIRE (P.T.S.)** **ABRIL DE 2008**

La resolución 601 de 2007 del MAVT establece los máximos permisibles para material particulado así:

| Contaminante | Unidad | Limite Máximo Permisible | Tiempo de Exposición |
|--------------|--------|--------------------------|----------------------|
| PST          | µg/m³  | 100                      | Anual                |
|              |        | 300                      | 24 horas             |
| PM10         |        | 70                       | Anual                |
|              |        | 150                      | 24 horas             |

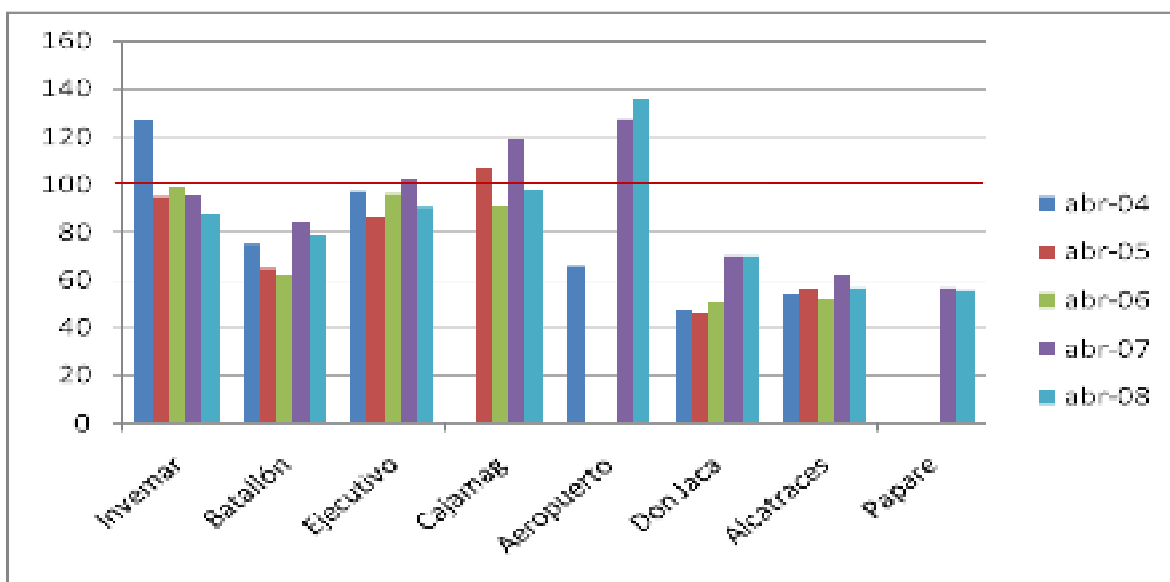
### INDICADORES MENSUALES (Abril 2008)

| ESTACION         | Variable | #Muestras mes | Menor Valor mes (fecha) |           | Mayor Valor mes (fecha) |           | Concentración Promedio mes |
|------------------|----------|---------------|-------------------------|-----------|-------------------------|-----------|----------------------------|
| AEROPUERTO       | PST      | 9             | 72.3                    | 15-abr-08 | 178.2                   | 18-abr-08 | 119.4                      |
| ALCATRACES       | PM-10    | 10            | 25.3                    | 24-abr-08 | 46.4                    | 21-abr-08 | 33.0                       |
| ALCATRACES       | PST      | 9             | 64.8                    | 27-abr-08 | 109.7                   | 21-abr-08 | 85.0                       |
| BATALLÓN         | PST      | 9             | 65.5                    | 27-abr-08 | 135.5                   | 18-abr-08 | 91.3                       |
| C. EJECUTIVO     | PST      | 8             | 88.3                    | 06-abr-08 | 143.3                   | 18-abr-08 | 105.3                      |
| CAJAMAG *        | PST      | 8             | 76.9                    | 27-abr-08 | 130.3                   | 18-abr-08 | 98.2                       |
| CARBOGRANELES    | PM-10    | 8             | 25.0                    | 27-abr-08 | 47.1                    | 18-abr-08 | 39.6                       |
| CLUB SANTA MARTA | PM-10    | 10            | 24.4                    | 03-abr-08 | 50.0                    | 15-abr-08 | 36.5                       |
| DON JACA         | PST      | 10            | 57.0                    | 27-abr-08 | 112.2                   | 18-abr-08 | 83.2                       |
| INVEMAR          | PST      | 9             | 52.4                    | 27-abr-08 | 211.9                   | 18-abr-08 | 110.4                      |
| PAPARE           | PST      | 6             | 81.6                    | 12-abr-08 | 130.6                   | 21-abr-08 | 106.2                      |
| ZUANA            | PM-10    | 10            | 29.1                    | 15-abr-08 | 45.1                    | 21-abr-08 | 36.1                       |

### INDICADORES ANUALES (01-abr-2007 a 31-mar-2008)

| Estación         | Variable | muestras año | Excedencias | %    | Prom. Aritmetico Anual | Prom. Geometrico Anual |
|------------------|----------|--------------|-------------|------|------------------------|------------------------|
| AEROPUERTO       | PST      | 112          | 85          | 75.9 |                        | 135.8                  |
| ALCATRACES       | PM-10    | 110          | 0           | 0    | 24.3                   |                        |
| ALCATRACES       | PST      | 106          | 3           | 2.8  |                        | 56.6                   |
| BATALLÓN         | PST      | 106          | 19          | 18   |                        | 78.4                   |
| C. EJECUTIVO     | PST      | 106          | 31          | 29.3 |                        | 90.4                   |
| CAJAMAG *        | PST      | 107          | 46          | 43   |                        | 97.7                   |
| CARBOGRANELES    | PM-10    | 109          | 1           | 0.9  | 36.7                   |                        |
| CLUB SANTA MARTA | PM-10    | 82           | 1           | 1.2  | 27.8                   |                        |
| DON JACA         | PST      | 101          | 1           | 10.9 |                        | 70.0                   |
| INVEMAR          | PST      | 109          | 41          | 37.6 |                        | 87.6                   |
| PAPARE           | PST      | 97           | 10          | 10.3 |                        | 55.9                   |
| ZUANA            | PM-10    | 36           | 0           | 0    | 37.1                   |                        |

| PROMEDIOS GEOMETRICOS ANUALES |         |          |           |         |            |          |            |        |
|-------------------------------|---------|----------|-----------|---------|------------|----------|------------|--------|
| Fecha                         | Invemar | Batallón | Ejecutivo | Cajamag | Aeropuerto | Don Jaca | Alcatraces | Papare |
| May-03 Abr-04                 | 126.7   | 74.7     | 96.9      |         | 65.8       | 47.3     | 54.0       |        |
| May-04 Abr-05                 | 94.8    | 64.4     | 86.1      | 106.5   |            | 46.2     | 55.9       |        |
| May-05 Abr-06                 | 98.6    | 62.0     | 95.8      | 91.1    |            | 50.6     | 51.9       |        |
| May-06 Abr-07                 | 95.6    | 84.1     | 101.7     | 119.3   | 127.3      | 70.2     | 62.2       | 56.6   |
|                               | 87.6    | 78.4     | 90.4      | 97.7    | 135.8      | 70.0     | 56.6       | 55.6   |



## CONCLUSIONES Y RECOMENDACIONES

### ZONA URBANA DE SANTA MARTA

En La zona urbana de Santa Marta en general, con relación al año anterior, se observa un descenso en los promedios geométricos anuales en todas las estaciones de PST, y en consecuencia también se observa un descenso en los días de alta contaminación o sea las excedencias. Todas las estaciones están dentro de la norma anual de  $100 \mu\text{g}/\text{m}^3$ .

En la estación de  $PM_{10}$  del Club Santa Marta se han tomado hasta la fecha 82 muestras con un promedio aritmético de  $27.8 \mu g/m^3$ , mostrando una tendencia muy favorable y similar a los registros observados en la anterior estación  $PM_{10}$  del Batallón.

## **ZONA AEROPUERTO – CIENAGA**

En la zona comprendida entre el Zuana y Ciénaga las condiciones se mantienen estables con un ligero descenso en el promedio geométrico en los Alcatraces.

En los monitores  $PM_{10}$  de Alcatraces  $24.3 \mu g/m^3$  de promedio aritmético anual, en carbogranes es de  $36.7 \mu g/m^3$  y en el Zuana es de  $37.1$  con 36 muestras tomadas. Esto indica que en cuanto a las partículas respirables es buena la calidad del aire en esta zona.

Como se observa en la grafica la estación de Aeropuerto permanece por encima de la norma anual de  $100 \mu g/m^3$ .

## RESULTADOS DEL MUESTREO

| <i>INVEVAR – PTS</i> |                 |                      |                    |                     |                   |                              |                                       |
|----------------------|-----------------|----------------------|--------------------|---------------------|-------------------|------------------------------|---------------------------------------|
| <i>Fecha</i>         | <i>FiltroNo</i> | <i>PesoInicial g</i> | <i>PesoFinal g</i> | <i>Peso Neto µg</i> | <i>Tiempo min</i> | <i>Volumen m<sup>3</sup></i> | <i>Concentración µg/m<sup>3</sup></i> |
| 03/04/2008           | 9706            | 2.7612               | 2.9563             | 195100              | 1386              | 1626.0                       | 120.0                                 |
| 09/04/2008           | 9732            | 2.8784               | 3.0070             | 128600              | 1386              | 1629.4                       | 78.9                                  |
| 12/04/2008           | 9745            | 2.8797               | 3.0838             | 204100              | 1434              | 1676.4                       | 121.7                                 |
| 15/04/2008           | 9758            | 2.8833               | 3.1070             | 223700              | 1440              | 1697.9                       | 131.7                                 |
| 18/04/2008           | 9771            | 2.9057               | 3.2633             | 357600              | 1446              | 1687.6                       | 211.9                                 |
| 21/04/2008           | 9783            | 2.9224               | 3.1028             | 180400              | 1416              | 1657.3                       | 108.9                                 |
| 24/04/2008           | 9795            | 2.8961               | 3.0547             | 158600              | 1446              | 1690.8                       | 93.8                                  |
| 27/04/2008           | 9807            | 2.8540               | 2.9421             | 88100               | 1434              | 1681.5                       | 52.4                                  |
| 30/04/2008           | 9819            | 2.6856               | 2.8128             | 127200              | 1452              | 1717.1                       | 74.1                                  |

| <i>CENTRO EJECUTIVO</i> |                 |                      |                    |                     |                   |                              |                                       |
|-------------------------|-----------------|----------------------|--------------------|---------------------|-------------------|------------------------------|---------------------------------------|
| <i>Fecha</i>            | <i>FiltroNo</i> | <i>PesoInicial g</i> | <i>PesoFinal g</i> | <i>Peso Neto µg</i> | <i>Tiempo min</i> | <i>Volumen m<sup>3</sup></i> | <i>Concentración µg/m<sup>3</sup></i> |
| 03/04/2008              | 9703            | 2.7398               | 2.9106             | 170800              | 1440              | 1674.9                       | 102.0                                 |
| 06/04/2008              | 9716            | 2.8908               | 3.0380             | 147200              | 1440              | 1667.8                       | 88.3                                  |
| 09/04/2008              | 9729            | 2.8973               | 3.0609             | 163600              | 1434              | 1662.0                       | 98.4                                  |
| 12/04/2008              | 9741            | 2.8911               | 3.0910             | 199900              | 1434              | 1661.6                       | 120.3                                 |
| 15/04/2008              | 9755            | 2.8873               | 3.0356             | 148300              | 1428              | 1652.7                       | 89.7                                  |
| 18/04/2008              | 9768            | 2.8524               | 3.0918             | 239400              | 1440              | 1670.2                       | 143.3                                 |
| 24/04/2008              | 9792            | 2.8803               | 3.0486             | 168300              | 1434              | 1661.2                       | 101.3                                 |
| 30/04/2008              | 9816            | 2.6913               | 2.8559             | 164600              | 1434              | 1666.3                       | 98.8                                  |

| <i>BATALLON – PTS</i> |                 |                      |                    |                     |                   |                              |                                       |
|-----------------------|-----------------|----------------------|--------------------|---------------------|-------------------|------------------------------|---------------------------------------|
| <i>Fecha</i>          | <i>FiltroNo</i> | <i>PesoInicial g</i> | <i>PesoFinal g</i> | <i>Peso Neto µg</i> | <i>Tiempo min</i> | <i>Volumen m<sup>3</sup></i> | <i>Concentración µg/m<sup>3</sup></i> |
| 03/04/2008            | 9702            | 2.7607               | 2.8981             | 137400              | 1440              | 1657.1                       | 82.9                                  |
| 06/04/2008            | 9715            | 2.8458               | 3.0142             | 168400              | 1394              | 1604.7                       | 104.9                                 |
| 09/04/2008            | 9728            | 2.8830               | 3.0277             | 144700              | 1440              | 1653.3                       | 87.5                                  |
| 12/04/2008            | 9740            | 2.8964               | 3.0249             | 128500              | 1428              | 1639.9                       | 78.4                                  |
| 15/04/2008            | 9754            | 2.8843               | 3.0335             | 149200              | 1440              | 1652.0                       | 90.3                                  |
| 18/04/2008            | 9767            | 2.8680               | 3.0919             | 223900              | 1440              | 1651.9                       | 135.5                                 |
| 24/04/2008            | 9791            | 2.8833               | 3.0188             | 135500              | 1440              | 1653.0                       | 82.0                                  |
| 27/04/2008            | 9803            | 2.8641               | 2.9725             | 108400              | 1440              | 1653.8                       | 65.5                                  |
| 30/04/2008            | 9815            | 2.6932               | 2.8494             | 156200              | 1440              | 1659.0                       | 94.2                                  |

| <b>CAJAMAG-MOLINO SANTA MARTA-PTS</b> |                 |                      |                    |                     |                   |                              |                                       |
|---------------------------------------|-----------------|----------------------|--------------------|---------------------|-------------------|------------------------------|---------------------------------------|
| <i>Fecha</i>                          | <i>FiltroNo</i> | <i>PesoInicial g</i> | <i>PesoFinal g</i> | <i>Peso Neto µg</i> | <i>Tiempo min</i> | <i>Volumen m<sup>3</sup></i> | <i>Concentración µg/m<sup>3</sup></i> |
| 03/04/2008                            | 9704            | 2.7471               | 2.9123             | 165200              | 1428              | 1657.4                       | 99.7                                  |
| 09/04/2008                            | 9730            | 2.9015               | 3.0588             | 157300              | 1434              | 1660.4                       | 94.7                                  |
| 12/04/2008                            | 9742            | 2.8914               | 3.0420             | 150600              | 1428              | 1650.4                       | 91.3                                  |
| 15/04/2008                            | 9756            | 2.8876               | 3.0352             | 147600              | 1434              | 1656.5                       | 89.1                                  |
| 18/04/2008                            | 9769            | 2.8873               | 3.1098             | 222500              | 1470              | 1708.1                       | 130.3                                 |
| 21/04/2008                            | 9781            | 2.8858               | 3.0696             | 183800              | 1452              | 1671.7                       | 109.9                                 |
| 24/04/2008                            | 9793            | 2.8877               | 3.0431             | 155400              | 1434              | 1659.3                       | 93.7                                  |
| 27/04/2008                            | 9805            | 2.8667               | 2.9942             | 127500              | 1428              | 1657.8                       | 76.9                                  |

| <b>CLUB SANTA MARTA - PM10</b> |                 |                      |                    |                     |                   |                              |                                       |
|--------------------------------|-----------------|----------------------|--------------------|---------------------|-------------------|------------------------------|---------------------------------------|
| <i>Fecha</i>                   | <i>FiltroNo</i> | <i>PesoInicial g</i> | <i>PesoFinal g</i> | <i>Peso Neto µg</i> | <i>Tiempo min</i> | <i>Volumen m<sup>3</sup></i> | <i>Concentración µg/m<sup>3</sup></i> |
| 03/04/2008                     | 9705            | 2.7437               | 2.7828             | 39100               | 1386              | 1601.9                       | 24.4                                  |
| 06/04/2008                     | 9718            | 2.9002               | 2.9590             | 58800               | 1434              | 1650.7                       | 35.6                                  |
| 09/04/2008                     | 9731            | 2.9076               | 2.9558             | 48200               | 1440              | 1656.5                       | 29.1                                  |
| 12/04/2008                     | 9743            | 2.8913               | 2.9335             | 42200               | 1446              | 1664.1                       | 25.4                                  |
| 15/04/2008                     | 9757            | 2.8821               | 2.9645             | 82400               | 1434              | 1649.6                       | 50.0                                  |
| 18/04/2008                     | 9770            | 2.9214               | 2.9973             | 75900               | 1428              | 1639.3                       | 46.3                                  |
| 21/04/2008                     | 9782            | 2.8926               | 2.9672             | 74600               | 1440              | 1656.5                       | 45.0                                  |
| 24/04/2008                     | 9794            | 2.8975               | 2.9583             | 60800               | 1434              | 1652.4                       | 36.8                                  |
| 27/04/2008                     | 9806            | 2.8706               | 2.9292             | 58600               | 1440              | 1660.6                       | 35.3                                  |
| 30/04/2008                     | 9818            | 2.6863               | 2.7474             | 61100               | 1440              | 1662.3                       | 36.8                                  |

| <b>AEROPUERTO-PTS</b> |                 |                      |                    |                     |                   |                              |                                       |
|-----------------------|-----------------|----------------------|--------------------|---------------------|-------------------|------------------------------|---------------------------------------|
| <i>Fecha</i>          | <i>FiltroNo</i> | <i>PesoInicial g</i> | <i>PesoFinal g</i> | <i>Peso Neto µg</i> | <i>Tiempo min</i> | <i>Volumen m<sup>3</sup></i> | <i>Concentración µg/m<sup>3</sup></i> |
| 03/04/2008            | 9700            | 2.7440               | 3.0161             | 272100              | 1440              | 1666.8                       | 163.2                                 |
| 06/04/2008            | 9713            | 2.8895               | 3.1464             | 256900              | 1440              | 1660.5                       | 154.7                                 |
| 09/04/2008            | 9726            | 2.8977               | 3.0669             | 169200              | 1440              | 1666.4                       | 101.5                                 |
| 15/04/2008            | 9752            | 2.8950               | 3.0151             | 120100              | 1438              | 1660.1                       | 72.3                                  |
| 18/04/2008            | 9765            | 2.8804               | 3.1763             | 295900              | 1440              | 1660.7                       | 178.2                                 |
| 21/04/2008            | 9777            | 2.9162               | 3.1093             | 193100              | 1440              | 1658.8                       | 116.4                                 |
| 24/04/2008            | 9789            | 2.8954               | 3.0375             | 142100              | 1440              | 1663.4                       | 85.4                                  |
| 27/04/2008            | 9801            | 2.8452               | 3.0015             | 156300              | 1440              | 1663.1                       | 94.0                                  |
| 30/04/2008            | 9813            | 2.6741               | 2.8546             | 180500              | 1440              | 1666.4                       | 108.3                                 |

| <b>CARBOGRANELES – PM10</b> |                 |                           |                        |                     |                       |                              |                                            |
|-----------------------------|-----------------|---------------------------|------------------------|---------------------|-----------------------|------------------------------|--------------------------------------------|
| <i>Fecha</i>                | <i>FiltroNo</i> | <i>PesoInicia<br/>l g</i> | <i>PesoFinal<br/>g</i> | <i>Peso Neto µg</i> | <i>Tiempo<br/>min</i> | <i>Volumen m<sup>3</sup></i> | <i>Concentracio<br/>n µg/m<sup>3</sup></i> |
| 03/04/2008                  | 9699            | 2.7581                    | 2.8269                 | 68800               | 1440                  | 1680.0                       | 41.0                                       |
| 09/04/2008                  | 9725            | 2.9022                    | 2.9673                 | 65100               | 1440                  | 1674.8                       | 38.9                                       |
| 12/04/2008                  | 9737            | 2.9002                    | 2.9648                 | 64600               | 1439                  | 1676.5                       | 38.5                                       |
| 18/04/2008                  | 9764            | 2.8828                    | 2.9619                 | 79100               | 1440                  | 1677.9                       | 47.1                                       |
| 21/04/2008                  | 9776            | 2.9058                    | 2.9829                 | 77100               | 1440                  | 1675.7                       | 46.0                                       |
| 24/04/2008                  | 9788            | 2.8711                    | 2.9268                 | 55700               | 1440                  | 1677.3                       | 33.2                                       |
| 27/04/2008                  | 9800            | 2.8498                    | 2.8917                 | 41900               | 1440                  | 1678.7                       | 25.0                                       |
| 30/04/2008                  | 9812            | 2.6800                    | 2.7587                 | 78700               | 1440                  | 1676.8                       | 46.9                                       |

| <b>DON JACA – PTS</b> |                 |                           |                        |                         |                   |                              |                                            |
|-----------------------|-----------------|---------------------------|------------------------|-------------------------|-------------------|------------------------------|--------------------------------------------|
| <i>Fecha</i>          | <i>FiltroNo</i> | <i>PesoInicia<br/>l g</i> | <i>PesoFinal<br/>g</i> | <i>Peso Neto<br/>µg</i> | <i>Tiempo min</i> | <i>Volumen m<sup>3</sup></i> | <i>Concentracio<br/>n µg/m<sup>3</sup></i> |
| 03/04/2008            | 9698            | 2.7495                    | 2.9153                 | 165800                  | 1440              | 1677.7                       | 98.8                                       |
| 06/04/2008            | 9711            | 2.8833                    | 3.0122                 | 128900                  | 1434              | 1666.3                       | 77.4                                       |
| 09/04/2008            | 9724            | 2.8903                    | 3.0131                 | 122800                  | 1434              | 1664.8                       | 73.8                                       |
| 12/04/2008            | 9736            | 2.9075                    | 3.0404                 | 132900                  | 1434              | 1665.2                       | 79.8                                       |
| 15/04/2008            | 9750            | 2.8913                    | 3.0167                 | 125400                  | 1446              | 1683.6                       | 74.5                                       |
| 18/04/2008            | 9763            | 2.8919                    | 3.0788                 | 186900                  | 1434              | 1666.3                       | 112.2                                      |
| 21/04/2008            | 9775            | 2.8945                    | 3.0551                 | 160600                  | 1440              | 1673.3                       | 96.0                                       |
| 24/04/2008            | 9787            | 2.8756                    | 2.9775                 | 101900                  | 1380              | 1606.4                       | 63.4                                       |
| 27/04/2008            | 9799            | 2.8574                    | 2.9525                 | 95100                   | 1434              | 1669.3                       | 57.0                                       |
| 30/04/2008            | 9811            | 2.6813                    | 2.8469                 | 165600                  | 1440              | 1672.5                       | 99.0                                       |

| <b>ALCATRACES-PM10</b> |                 |                      |                        |                         |                       |                              |                                            |
|------------------------|-----------------|----------------------|------------------------|-------------------------|-----------------------|------------------------------|--------------------------------------------|
| <i>Fecha</i>           | <i>FiltroNo</i> | <i>PesoInicial g</i> | <i>PesoFinal<br/>g</i> | <i>Peso Neto<br/>µg</i> | <i>Tiempo<br/>min</i> | <i>Volumen m<sup>3</sup></i> | <i>Concentracio<br/>n µg/m<sup>3</sup></i> |
| 03/04/2008             | 9696            | 2.7537               | 2.8099                 | 56200                   | 1440                  | 1680.3                       | 33.4                                       |
| 06/04/2008             | 9709            | 2.7368               | 2.7885                 | 51700                   | 1440                  | 1680.6                       | 30.8                                       |
| 09/04/2008             | 9722            | 2.8866               | 2.9332                 | 46600                   | 1440                  | 1679.5                       | 27.7                                       |
| 12/04/2008             | 9734            | 2.9000               | 2.9507                 | 50700                   | 1428                  | 1665.5                       | 30.4                                       |
| 15/04/2008             | 9748            | 2.8922               | 2.9390                 | 46800                   | 1440                  | 1679.1                       | 27.9                                       |
| 18/04/2008             | 9761            | 2.8927               | 2.9664                 | 73700                   | 1440                  | 1675.8                       | 44.0                                       |
| 21/04/2008             | 9773            | 2.8960               | 2.9738                 | 77800                   | 1440                  | 1676.5                       | 46.4                                       |
| 24/04/2008             | 9785            | 2.9162               | 2.9569                 | 40700                   | 1380                  | 1606.7                       | 25.3                                       |
| 27/04/2008             | 9797            | 2.8890               | 2.9328                 | 43800                   | 1431                  | 1670.2                       | 26.2                                       |
| 30/04/2008             | 9809            | 2.8886               | 2.9528                 | 64200                   | 1440                  | 1679.7                       | 38.2                                       |

| <i>ALCATRACES-PTS</i> |                 |                      |                    |                     |                   |                              |                                       |
|-----------------------|-----------------|----------------------|--------------------|---------------------|-------------------|------------------------------|---------------------------------------|
| <i>Fecha</i>          | <i>FiltroNo</i> | <i>PesoInicial g</i> | <i>PesoFinal g</i> | <i>Peso Neto µg</i> | <i>Tiempo min</i> | <i>Volumen m<sup>3</sup></i> | <i>Concentración µg/m<sup>3</sup></i> |
| 03/04/2008            | 9697            | 2.7561               | 2.9242             | 168100              | 1440              | 1671.8                       | 100.5                                 |
| 06/04/2008            | 9710            | 2.7455               | 2.8696             | 124100              | 1440              | 1672.8                       | 74.2                                  |
| 09/04/2008            | 9723            | 2.8850               | 3.0080             | 123000              | 1440              | 1668.0                       | 73.7                                  |
| 12/04/2008            | 9735            | 2.9089               | 3.0487             | 139800              | 1428              | 1650.9                       | 84.7                                  |
| 15/04/2008            | 9749            | 2.8937               | 3.0317             | 138000              | 1440              | 1667.3                       | 82.8                                  |
| 18/04/2008            | 9762            | 2.8878               | 3.0598             | 172000              | 1440              | 1666.0                       | 103.2                                 |
| 21/04/2008            | 9774            | 2.8893               | 3.0721             | 182800              | 1440              | 1666.7                       | 109.7                                 |
| 24/04/2008            | 9786            | 2.9112               | 3.0253             | 114100              | 1380              | 1601.3                       | 71.3                                  |
| 27/04/2008            | 9798            | 2.8574               | 2.9648             | 107400              | 1431              | 1658.3                       | 64.8                                  |

| <i>ZUANA-PM10</i> |                 |                      |                    |                     |                   |                              |                                       |
|-------------------|-----------------|----------------------|--------------------|---------------------|-------------------|------------------------------|---------------------------------------|
| <i>Fecha</i>      | <i>FiltroNo</i> | <i>PesoInicial g</i> | <i>PesoFinal g</i> | <i>Peso Neto µg</i> | <i>Tiempo min</i> | <i>Volumen m<sup>3</sup></i> | <i>Concentración µg/m<sup>3</sup></i> |
| 03/04/2008        | 9701            | 2.7585               | 2.8226             | 64100               | 1440              | 1679.1                       | 38.2                                  |
| 06/04/2008        | 9714            | 2.8710               | 2.9276             | 56600               | 1440              | 1674.2                       | 33.8                                  |
| 09/04/2008        | 9727            | 2.9005               | 2.9589             | 58400               | 1440              | 1672.6                       | 34.9                                  |
| 12/04/2008        | 9739            | 2.9069               | 2.9558             | 48900               | 1440              | 1672.0                       | 29.2                                  |
| 15/04/2008        | 9753            | 2.8890               | 2.9375             | 48500               | 1437              | 1667.3                       | 29.1                                  |
| 18/04/2008        | 9766            | 2.8740               | 2.9444             | 70400               | 1440              | 1670.0                       | 42.2                                  |
| 21/04/2008        | 9778            | 2.8973               | 2.9727             | 75400               | 1441              | 1672.0                       | 45.1                                  |
| 24/04/2008        | 9790            | 2.8920               | 2.9531             | 61100               | 1440              | 1673.3                       | 36.5                                  |
| 27/04/2008        | 9802            | 2.8698               | 2.9280             | 58200               | 1420              | 1651.7                       | 35.2                                  |
| 30/04/2008        | 9814            | 2.6904               | 2.7522             | 61800               | 1440              | 1676.1                       | 36.9                                  |

| <i>PAPARE-PTS</i> |                 |                      |                    |                     |                   |                              |                                       |
|-------------------|-----------------|----------------------|--------------------|---------------------|-------------------|------------------------------|---------------------------------------|
| <i>Fecha</i>      | <i>FiltroNo</i> | <i>PesoInicial g</i> | <i>PesoFinal g</i> | <i>Peso Neto µg</i> | <i>Tiempo min</i> | <i>Volumen m<sup>3</sup></i> | <i>Concentración µg/m<sup>3</sup></i> |
| 03/04/2008        | 9695            | 2.7569               | 2.9038             | 146900              | 1428              | 1649.2                       | 89.1                                  |
| 12/04/2008        | 9733            | 2.9042               | 3.0347             | 130500              | 1386              | 1599.6                       | 81.6                                  |
| 15/04/2008        | 9747            | 2.9044               | 3.0456             | 141200              | 1434              | 1652.6                       | 85.4                                  |
| 18/04/2008        | 9760            | 2.8554               | 3.0675             | 212100              | 1434              | 1654.8                       | 128.2                                 |
| 21/04/2008        | 9772            | 2.9081               | 3.1235             | 215400              | 1434              | 1649.7                       | 130.6                                 |
| 30/04/2008        | 9808            | 2.8810               | 3.0805             | 199500              | 1410              | 1629.1                       | 122.5                                 |

**CALIBRACIÓN DE EQUIPOS**  
**ABRIL 2008**

|                                               |                          |                           |                          |        |          |            |       |        |
|-----------------------------------------------|--------------------------|---------------------------|--------------------------|--------|----------|------------|-------|--------|
| Localización:                                 |                          | INVEMAR                   |                          | Fecha: |          | 07-abr-08  |       |        |
| Monitor:                                      | SN 61728                 |                           | Orificio de Calibración: |        |          | SN 60507   |       |        |
| Condiciones Ambientales (promedio estacional) |                          |                           |                          |        | Ta=28 °C | Pa=758mmHg |       |        |
| P <sub>orificio(H2O)</sub>                    | P <sub>equipo(H2O)</sub> | P <sub>equipo(mmHg)</sub> | P1                       | P1/Pa  | Qa Orif  | Qa(tabla)  | Qst   | % Dif. |
| 5.8                                           | 11.2                     | 20.92                     | 737.08                   | 0.972  | 1.196933 | 1.202      | 1.187 | -0.85  |
| 5.6                                           | 15.4                     | 28.76                     | 729.24                   | 0.962  | 1.176002 | 1.179      | 1.164 | -1.03  |
| 5.3                                           | 22.9                     | 42.77                     | 715.23                   | 0.944  | 1.143891 | 1.134      | 1.120 | -2.13  |
| 4.1                                           | 39.2                     | 73.21                     | 684.79                   | 0.903  | 1.005306 | 1.023      | 1.010 | 0.45   |
| 3.0                                           | 52.5                     | 98.05                     | 659.95                   | 0.871  | 0.858992 | 0.917      | 0.905 | 5.11   |

|                                               |                           |                            |                          |        |          |            |       |        |
|-----------------------------------------------|---------------------------|----------------------------|--------------------------|--------|----------|------------|-------|--------|
| Localización:                                 |                           | BATALLON                   |                          | Fecha: |          | 24-abr-08  |       |        |
| Monitor:                                      | SN 61719                  |                            | Orificio de Calibración: |        |          | SN 60507   |       |        |
| Condiciones Ambientales (promedio estacional) |                           |                            |                          |        | Ta=28 °C | Pa=758mmHg |       |        |
| P <sub>orificio</sub> (H2O)                   | P <sub>equipo</sub> (H2O) | P <sub>equipo</sub> (mmHg) | P1                       | P1/Pa  | Qa Orif  | Qa(tabla)  | Qst   | % Dif. |
| 5.6                                           | 10.2                      | 19.05                      | 738.95                   | 0.975  | 1.176002 | 1.200      | 1.185 | 0.79   |
| 5.4                                           | 16.1                      | 30.07                      | 727.93                   | 0.960  | 1.154693 | 1.169      | 1.155 | 0.00   |
| 5.0                                           | 25.2                      | 47.06                      | 710.94                   | 0.938  | 1.110857 | 1.114      | 1.100 | -0.95  |
| 4.5                                           | 40.6                      | 75.83                      | 682.17                   | 0.900  | 1.053516 | 1.002      | 0.990 | -6.46  |
| 3.2                                           | 53.4                      | 99.73                      | 658.27                   | 0.868  | 0.887377 | 0.891      | 0.879 | -0.91  |

|                                               |                           |                            |                          |        |          |            |       |        |
|-----------------------------------------------|---------------------------|----------------------------|--------------------------|--------|----------|------------|-------|--------|
| Localización:                                 |                           | EJECUTIVO                  |                          | Fecha: |          | 30-abr-08  |       |        |
| Monitor:                                      | SN 61729                  |                            | Orificio de Calibración: |        |          | SN 60507   |       |        |
| Condiciones Ambientales (promedio estacional) |                           |                            |                          |        | Ta=28 °C | Pa=758mmHg |       |        |
| P <sub>orificio</sub> (H2O)                   | P <sub>equipo</sub> (H2O) | P <sub>equipo</sub> (mmHg) | P1                       | P1/Pa  | Qa Orif  | Qa(tabla)  | Qst   | % Dif. |
| 5.4                                           | 10.1                      | 18.86                      | 739.14                   | 0.975  | 1.154693 | 1.204      | 1.188 | 2.84   |
| 5.3                                           | 15.3                      | 28.58                      | 729.43                   | 0.962  | 1.143891 | 1.176      | 1.161 | 1.51   |
| 4.9                                           | 23.5                      | 43.89                      | 714.11                   | 0.942  | 1.099627 | 1.128      | 1.114 | 1.26   |
| 3.9                                           | 37.8                      | 70.60                      | 687.40                   | 0.907  | 0.980318 | 1.028      | 1.015 | 3.40   |
| 2.9                                           | 52.1                      | 51.80                      | 706.20                   | 0.932  | 0.844444 | 1.100      | 1.086 | 22.27  |

|                                               |                          |                           |                          |        |          |            |       |        |
|-----------------------------------------------|--------------------------|---------------------------|--------------------------|--------|----------|------------|-------|--------|
| Localización:                                 |                          | DON JACA                  |                          | Fecha: |          | 03-abr-08  |       |        |
| Monitor:                                      | SN 61731                 |                           | Orificio de Calibración: |        |          | SN 60507   |       |        |
| Condiciones Ambientales (promedio estacional) |                          |                           |                          |        | Ta=28 °C | Pa=758mmHg |       |        |
| P <sub>orificio(H2O)</sub>                    | P <sub>equipo(H2O)</sub> | P <sub>equipo(mmHg)</sub> | P1                       | P1/Pa  | Qa Orif  | Qa(tabla)  | Qst   | % Dif. |
| 5.5                                           | 10.2                     | 19.05                     | 738.95                   | 0.975  | 1.165396 | 1.201      | 1.186 | 1.73   |
| 5.4                                           | 15.6                     | 29.14                     | 728.86                   | 0.962  | 1.154693 | 1.174      | 1.159 | 0.38   |
| 5.1                                           | 24.1                     | 45.01                     | 712.99                   | 0.941  | 1.121976 | 1.124      | 1.110 | -1.08  |
| 4.0                                           | 38.9                     | 72.65                     | 685.35                   | 0.904  | 0.992890 | 1.017      | 1.004 | 1.09   |
| 2.9                                           | 52.1                     | 97.30                     | 660.70                   | 0.872  | 0.844444 | 0.899      | 0.887 | 4.83   |

|                                               |                                        |                             |                          |        |          |            |       |        |
|-----------------------------------------------|----------------------------------------|-----------------------------|--------------------------|--------|----------|------------|-------|--------|
| Localización:                                 |                                        | ALCATRACES PM <sub>10</sub> |                          | Fecha: |          | 09-abr-08  |       |        |
| Monitor:                                      | 61696                                  |                             | Orificio de Calibración: |        |          | SN 60507   |       |        |
| Condiciones Ambientales (promedio estacional) |                                        |                             |                          |        | Ta=28 °C | Pa=758mmHg |       |        |
| P <sub>orificio</sub> (H <sub>2</sub> O)      | P <sub>equipo</sub> (H <sub>2</sub> O) | P <sub>equipo</sub> (mmHg)  | P1                       | P1/Pa  | Qa Orif  | Qa(tabla)  | Qst   | % Dif. |
| 5.7                                           | 10.3                                   | 19.24                       | 738.76                   | 0.975  | 1.186514 | 1.193      | 1.178 | -0.7   |
| 5.3                                           | 15.6                                   | 29.14                       | 728.86                   | 0.962  | 1.143891 | 1.169      | 1.155 | 0.9    |
| 5.0                                           | 26.6                                   | 49.68                       | 708.32                   | 0.934  | 1.110857 | 1.111      | 1.097 | -1.3   |
| 4.0                                           | 38.2                                   | 71.34                       | 686.66                   | 0.906  | 0.992890 | 1.037      | 1.024 | 3.0    |
| 3.1                                           | 55.4                                   | 103.47                      | 654.53                   | 0.863  | 0.873299 | 0.902      | 0.891 | 2.0    |

|                                               |                           |                            |                          |        |          |            |       |        |
|-----------------------------------------------|---------------------------|----------------------------|--------------------------|--------|----------|------------|-------|--------|
| Localización:                                 |                           | PAPARE                     |                          | Fecha: |          | 09-abr-08  |       |        |
| Monitor:                                      | SN P3540                  |                            | Orificio de Calibración: |        |          | SN 60507   |       |        |
| Condiciones Ambientales (promedio estacional) |                           |                            |                          |        | Ta=28 °C | Pa=758mmHg |       |        |
| P <sub>orificio</sub> (H2O)                   | P <sub>equipo</sub> (H2O) | P <sub>equipo</sub> (mmHg) | P1                       | P1/Pa  | Qa Orif  | Qa(tabla)  | Qst   | % Dif. |
| 5.5                                           | 10.2                      | 19.05                      | 738.95                   | 0.975  | 1.165396 | 1.184      | 1.169 | 0.28   |
| 5.3                                           | 15.1                      | 28.20                      | 729.80                   | 0.963  | 1.143891 | 1.168      | 1.154 | 0.83   |
| 4.5                                           | 22.9                      | 42.77                      | 715.23                   | 0.944  | 1.053516 | 1.144      | 1.129 | 6.71   |
| 3.8                                           | 36.0                      | 67.24                      | 690.76                   | 0.911  | 0.967584 | 1.103      | 1.089 | 11.13  |
| 2.9                                           | 49.5                      | 92.45                      | 665.55                   | 0.878  | 0.844444 | 1.060      | 1.047 | 19.34  |

|                                               |                                        |                                |                          |       |          |           |            |        |
|-----------------------------------------------|----------------------------------------|--------------------------------|--------------------------|-------|----------|-----------|------------|--------|
| Localización:                                 |                                        | CLUB STAMARTA PM <sub>10</sub> |                          |       | Fecha:   |           | 03-abr-08  |        |
| Monitor:                                      | SN 61695                               |                                | Orificio de Calibración: |       |          | SN 60507  |            |        |
| Condiciones Ambientales (promedio estacional) |                                        |                                |                          |       | Ta=28 °C |           | Pa=758mmHg |        |
| P <sub>orificio</sub> (H <sub>2</sub> O)      | P <sub>equipo</sub> (H <sub>2</sub> O) | P <sub>equipo</sub> (mmHg)     | P1                       | P1/Pa | Qa Orif  | Qa(tabla) | Qst        | % Dif. |
| 5.6                                           | 10.0                                   | 18.68                          | 739.32                   | 0.975 | 1.176002 | 1.1907    | 1.176      | -0.03  |
| 5.3                                           | 16.7                                   | 31.19                          | 726.81                   | 0.959 | 1.143891 | 1.1604    | 1.146      | 0.17   |
| 5.1                                           | 24.0                                   | 44.82                          | 713.18                   | 0.941 | 1.121976 | 1.1208    | 1.107      | -1.38  |
| 4.5                                           | 39.2                                   | 73.21                          | 684.79                   | 0.903 | 1.053516 | 1.0162    | 1.003      | -4.99  |
| 3.0                                           | 55.1                                   | 102.91                         | 655.09                   | 0.864 | 0.858992 | 0.8748    | 0.864      | 0.56   |