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# Level IV Data Package

MWH Group 230066

**Method: 4500H- pH**

2802090001

2802090002

2802090003

2802090004

2802090005

2802090006

2802090007

ISE - pH MW SOP REVISION 4  
SM4500-H+ B

W31  
2/14/08

Analysis Date Completed: 02/14/08

Analyst: N. H. H.

Reviewed By: Yolda 2/14/08

LIMS By: Jm 2/17/08 2/18/08

Was QC Criteria Met:  Y  N

Was QIR Needed:  Y  N

pH 4 Buffer R# 201604 Exp. 5/09  
pH 7 Buffer R# 201522 Exp. 9/08  
pH 10 Buffer R# 201683 Exp. 12/08  
pH 6 Buffer R# 201680 Exp. 4/09

| Buffers |         |      |         |
|---------|---------|------|---------|
|         | Initial |      |         |
|         | mV      | pH   | Temp °C |
| 4.0     | 413.904 | 10.8 | 3.904   |
| 7.0     | -7.6    |      | 7.009   |
| 10.0    | -106.2  |      | 10.000  |

McRuv  
Electrode Mfr Bovdo SN 413  
Meter Seven Multi S/N 1225287116  
Denver Instrument Model pH250 S/N K08094 (Aug 2006, new)  
Efficiency/Slope: 101% (-59.70)  
Efficiency taken directly from pH meter -7.2 mV

| Run #   | Sample Number | Sample ID | Date Collected | Client   | Temp °C | mV     | Reading pH units | Reported (± 0.1 units) | Comments                |
|---------|---------------|-----------|----------------|----------|---------|--------|------------------|------------------------|-------------------------|
| LCS     | pH 6.0        | -         | -              | -        | 18.5    | 51.1   | 5.991            | 5.99                   | ± 0.05 pH units of TV   |
| 1       | 2602090254    | M-57      | 2/7/08         | Kerridge | 18.6    | -41.4  | 7.590            | 7.6                    | ✓                       |
| 2       | 259           | M-56      |                |          | 18.5    | -46.2  | 7.531            | 7.5                    | ✓                       |
| 3       | 260           | M-55      |                |          | 18.5    | -63.4  | 7.939            | 7.9                    | ✓                       |
| 4       | 261           | M-53      |                |          | 18.6    | -55.9  | 7.823            | 7.8                    | ✓                       |
| 5       | 262           | M-70      |                |          | 20.6    | -57.5  | 7.624            | 7.6                    | ✓                       |
| 6       | 263           | M-71      |                |          | 18.6    | -31.6  | 7.406            | 7.4                    | ✓                       |
| 7       | 264           | M-72      |                |          | 18.5    | -35.8  | 7.485            | 7.5                    | ✓                       |
| 8       | 265           | M-38      |                |          | 19.3    | -31.1  | 7.318            | 7.3                    | ✓                       |
| 9       | 267           | M-36      |                |          | 18.7    | -22.8  | 7.265            | 7.3                    | ✓                       |
| 10      | 271           | M-84      |                |          | 18.6    | -62.3  | 7.951            | 7.95                   | ✓                       |
| Sem Dup | ↓             | ↓         |                |          | 18.9    | -62.6  | 7.949            | 7.95                   | ± 0.1 units of original |
| 11      | 272           | M-11      |                |          | 18.6    | -63.3  | 7.962            | 8.0                    | ✓                       |
| 12      | 273           | M-2       |                |          | 18.7    | -63.4  | 7.963            | 8.0                    | ✓                       |
| 13      | 274           | M-22A     |                |          | 18.6    | -22.0  | 7.204            | 7.2                    | ✓                       |
| 14      | 277           | M-89      |                |          | 18.6    | -23.7  | 7.277            | 7.3                    | ✓                       |
| 15      | 2802090001    | M-17A     | 2/6/08         |          | 18.8    | -32.5  | 7.431            | 7.4                    | ✓                       |
| 16      | 002           | M-76      |                |          | 21.5    | -56.9  | 7.638            | 7.6                    | ✓                       |
| 17      | 003           | M-75      |                |          | 22.1    | -51.8  | 7.751            | 7.6                    | ✓                       |
| 18      | 004           | M-111A    |                |          | 21.5    | -41.0  | 7.571            | 7.6                    | ✓                       |
| 19      | 005           | M-115     |                |          | 20.2    | -47.9  | 7.679            | 7.7                    | ✓                       |
| 20      | 006           | M-114A    |                |          | 19.9    | -46.8  | 7.677            | 7.68                   | ✓                       |
| Sem Dup | ↓             | ↓         |                |          | 19.4    | -51.6  | 7.755            | 7.76                   | ± 0.1 units of original |
| CAL STD | pH - 4.0      | -         | -              | -        | 18.5    | 164.0  | 4.039            | 4.04                   | ± 0.05 pH units of TV   |
| CAL STD | pH - 7.0      | -         | -              | -        | 18.6    | -9.3   | 7.839            | 7.04                   | ± 0.05 pH units of TV   |
| CAL STD | pH - 10.0     | -         | -              | -        | 18.7    | -185.4 | 10.050           | 10.05                  | ± 0.05 pH units of TV   |
| LCS     | pH - 8.0      | -         | -              | -        | 19.2    | 50.9   | 6.034            | 6.03                   | ± 0.05 pH units of TV   |

ISE - pH MW SOP REVISION 4  
SM4500-H+ B

W311  
2/12/08

Analysis Date Completed: 02/15/08

Analyst: Yacht

Reviewed By: Yolda 2/19/08 M20 F008

LIMS By: mm 2/20/08

Was QC Criteria Met:  Y  N

Was QIR Needed:  Y  N

pH 4 Buffer R# 201684 Exp. 5/09

pH 7 Buffer R# 201522 Exp. 9/08

pH 10 Buffer R# 201693 Exp. 12/09

pH 6 Buffer R# 201650 Exp. 4/09

Buffers

|      | Initial |        |         |
|------|---------|--------|---------|
|      | mV      | pH     | Temp °C |
| 4.0  | 166.0   | 3.998  | 18.7    |
| 7.0  | -8.4    | 6.994  | 18.5    |
| 10.0 | -185.0  | 10.004 | 20.3    |

McHL  
Electrode Mfr Tbledo SN 413

Meter Seven Multi S/N 1225287116

Denver Instrument Model pH250 S/N K08094 (Aug 2005, new)

Efficiency/Slope: 101% (-59.56)

Efficiency taken directly from pH meter -0.9 mV

| Run #   | Sample Number | Sample ID  | Date Collected | Client             | Temp °C      | mV     | Reading pH units | Reported (± 0.1 units)       | Comments |
|---------|---------------|------------|----------------|--------------------|--------------|--------|------------------|------------------------------|----------|
| LCS     | pH 6.0        | -          | -              | -                  | 20.4         | 49.7   | 6.005            | 6.00 ± 0.05 pH units of TV   |          |
| 1       | 2802080327    | Source     | 2/7/08         | <del>City of</del> | 19.6         | -77.4  | 8.173            | 8.2 ✓                        | HA       |
| 2       | 2802090007    | 1-N        | 2/8/08         | Kermigee           | 19.7         | -9.7   | 7.006            | 7.0 ✓                        |          |
| 3       | 28020110009   | Mont-Al    | 2/11/08        | <del>CEE</del>     | 19.1         | 56.6   | 5.858            | 5.8 ✓                        |          |
| 4       | 2802130453    | Arroyo     | 2/12/08        | <del>CEE</del>     | 19.3         | 11.1   | 6.641            | 6.6 ✓                        |          |
| 5       | 466           | CSO        | 2/10/08        | <del>CEE</del>     | 18.5         | -164.4 | 9.671            | 9.7 ✓                        |          |
| 6       | 477           | Source     | ↓              | ↓                  | 18.5         | -172.0 | 9.802            | 9.8 ✓                        |          |
| 7       | 2802110175    | Los-CSD    | 2/11/08        | ↓                  | 19.8<br>+0.8 | 15.2   | 7.379<br>7.992   | 6.4 ✓                        |          |
| 8       | 267           | Arrowhead  | ↓              | <del>City of</del> | 22.0         | -15.9  | 7.096            | 7.1 ✓                        |          |
| 9       | 2802120072    | Well 2     | ↓              | <del>City of</del> | 20.6         | -52.6  | 7.707            | 7.7 ✓                        |          |
| 10      | 0236          | 608400     | 2/12/08        | <del>City of</del> | 18.5         | -51.9  | 7.732            | 7.73 ✓                       |          |
| Sam Dup | ↓             | ↓          | ↓              | ↓                  | 18.6         | -55.4  | 7.792            | 7.79 ± 0.1 units of original |          |
| 11      | 242           | 608401     | ↓              | ↓                  | 18.9         | -57.0  | 7.815            | 7.8 ✓                        |          |
| 12      | 708           | CSO        | 2/11/08        | <del>CEE</del>     | 18.6         | 41.2   | 6.092            | 6.1 ✓                        |          |
| 13      | 749           | Effluent   | ↓              | Kermigee           | 18.7         | 4.4    | 6.764            | 6.8 ✓                        |          |
| 14      | 751           | Avenal     | ↓              | Vastavert          | 18.5         | -120.0 | 8.930            | 8.9 ✓                        |          |
| 15      | 752           | Source     | ↓              | <del>CEE</del>     | 18.5         | -42.9  | 7.583            | 7.6 ✓                        |          |
| 16      | 789           | hot Source | ↓              | ↓                  | 18.6         | -67.6  | 8.005            | 8.0 ✓                        |          |
| 17      | 825           | SP-3       | 2/12/08        | <del>City of</del> | 18.5         | -22.2  | 7.186            | 7.2 ✓                        |          |
| 18      | 860           | SP-4       | ↓              | ↓                  | 18.6         | -20.5  | 7.176            | 7.2 ✓                        |          |
| 19      | 867           | SP-5       | ↓              | ↓                  | 18.5         | -22.9  | 7.235            | 7.2 ✓                        |          |
| 20      | 857           | Wing Point | ↓              | <del>City of</del> | 20.5         | -7.6   | 6.977            | 7.0 ✓                        |          |
| Sam Dup | ↓             | ↓          | ↓              | ↓                  | 20.6         | -7.4   | 6.962            | 6.96 ± 0.1 units of original |          |
| CAL STD | pH - 4.0      | -          | -              | -                  | 18.6         | 163.6  | 4.041            | 4.04 ± 0.05 pH units of TV   |          |
| CAL STD | pH - 7.0      | -          | -              | -                  | 18.8         | -9.7   | 7.016            | 7.02 ± 0.05 pH units of TV   |          |
| CAL STD | pH - 10.0     | -          | -              | -                  | 18.5         | -185.2 | 10.029           | 10.03 ± 0.05 pH units of TV  |          |
| LCS     | pH - 8.0      | -          | -              | -                  | 19.0         | 47.6   | 6.032            | 6.03 ± 0.05 pH units of TV   |          |

**Standard  
Preparation  
Worksheet  
&  
Certificate of  
Analysis**

Reagent Documentation

Reagent: Buffer pH 4  
 Date Received: 03 Aug 07  
 Date Expired: May 2009  
 Manufacturer: JBDH  
 Storage Condition: room temp

Reagent #: 201684  
 By: TH  
 Matrix: aq  
 Amount: 20L  
 Lot #: 1705B36

| Component | Comment                   | Standard | Concentration |
|-----------|---------------------------|----------|---------------|
|           | <u>VWR # BDH 0198-20L</u> |          |               |
|           |                           |          |               |
|           |                           |          |               |
|           |                           |          |               |
|           |                           |          |               |

Comment:

Reagent: Anion Calibration Stock Soln A+B  
 Date Received: 07 August 07  
 Date Expired: 03 Feb 09  
 Manufacturer: CPI  
 Storage Condition: room temperature

Reagent #: 201685  
 By: TH  
 Matrix: aq  
 Amount: 10 x 100 mL  
 Lot #: 07H024

| Component | Comment  | Standard | Concentration |
|-----------|--|----------|---------------|
|           | <u>CPI # 4400-050110rh03</u>                     |          |               |
|           | <u>A B</u>                                       |          |               |
|           | <u>Cl 1000 µg/ml N(NO<sub>2</sub>) 100 µg/ml</u> |          |               |
|           | <u>N(NO<sub>2</sub>) 100 µg/ml</u>               |          |               |
|           | <u>SO<sub>4</sub> 2000 µg/ml</u>                 |          |               |
|           | <u>Br 40 µg/ml</u>                               |          |               |

Comment:

P 500 µg/ml

Reagent: Digestion Rgt for Kjeldahl  
 Date Received: 08/14/07  
 Date Expired: 06/2010  
 Manufacturer: HACH  
 Storage Condition: Room temp

Reagent #: 201686  
 By: JKZ  
 Matrix: aq  
 Amount: 4 x 1000 ml  
 Lot #: A 7159

| Component | Comment                    | Standard | Concentration |
|-----------|----------------------------|----------|---------------|
|           | <u>HACH Cat # 23404-53</u> |          |               |
|           |                            |          |               |
|           |                            |          |               |
|           |                            |          |               |
|           |                            |          |               |

Comment:

Reagent Documentation

**Reagent:** HNO3 Ultra II **Reagent #:** 201678  
**Date Received:** 7-20-07 / 911 Sep 07 / 2 Oct 07 / 06 Nov 07 **By:** MAF  
**Date Expired:** 12-20-07 **Matrix:** AB  
**Manufacturer:** JT Baker **Amount:** 3 x 500 mL / 3 x 500 mL / 4x  
**Storage Condition:** ROOM TEMP. **Lot #:** ED 9786 2x 520

| Component | Comment          | Standard | Concentration |
|-----------|------------------|----------|---------------|
|           | JT Baker 6901-05 |          |               |
|           |                  |          |               |
|           |                  |          |               |
|           |                  |          |               |
|           |                  |          |               |

Comment:

**Reagent:** MAGNESIUM PERCHLORATE **Reagent #:** 201679  
**Date Received:** 7-25-07 **By:** MAF  
**Date Expired:** ~~12-25-07~~ <sup>MAF</sup> 7-25-12 **Matrix:** IMPDET  
**Manufacturer:** EMD **Amount:** 4 x 500g  
**Storage Condition:** ROOM TEMP. **Lot #:** 470 29712

| Component | Comment    | Standard | Concentration |
|-----------|------------|----------|---------------|
|           | MX 6069A-1 |          |               |
|           |            |          |               |
|           |            |          |               |
|           |            |          |               |
|           |            |          |               |

Comment:

**Reagent:** pH 6.00 Buffer Solution **Reagent #:** 201680  
**Date Received:** 27 July 07 / 02 Nov 07 **By:** TCH  
**Date Expired:** 30 April 09 **Matrix:** Ag  
**Manufacturer:** VWR **Amount:** 12 x 500 mL  
**Storage Condition:** 100m-temp. **Lot #:** 7107

| Component | Comment         | Standard | Concentration |
|-----------|-----------------|----------|---------------|
|           | VWR # 34170-112 |          |               |
|           |                 |          |               |
|           |                 |          |               |
|           |                 |          |               |
|           |                 |          |               |

Comment:

### Reagent Documentation

**Reagent:** pH 7.00 Buffer  
**Date Received:** 21 Nov 06 / 29 Dec 06  
**Date Expired:** 30 Sept 08  
**Manufacturer:** VWR  
**Storage Condition:** room temperature

**Reagent #:** 201522  
**By:** GUA  
**Matrix:** ag  
**Amount:** 20L / 120-L  
**Lot #:** 6250

| Component | Comment         | Standard | Concentration |
|-----------|-----------------|----------|---------------|
|           | VWR # 3A170-158 |          |               |
|           |                 |          |               |
|           |                 |          |               |
|           |                 |          |               |
|           |                 |          |               |
|           |                 |          |               |

Comment:

**Reagent:** Ammonium Molybdate 4% sol'n  
**Date Received:** 27 Nov 06 / 29 Nov 06  
**Date Expired:** 29 Sep 07  
**Manufacturer:** Spectrum Chemical  
**Storage Condition:** refrigerate 4±2°C

**Reagent #:** 201523  
**By:** LMR  
**Matrix:** ag  
**Amount:** 6 x 500ml / 2 x 500ml  
**Lot #:** 6270-14

| Component | Comment               | Standard | Concentration |
|-----------|-----------------------|----------|---------------|
|           | Spectrum Chem # A-320 |          |               |
|           |                       |          |               |
|           |                       |          |               |
|           |                       |          |               |
|           |                       |          |               |
|           |                       |          |               |

Comment:

**Reagent:** Ultrex HNO<sub>3</sub>  
**Date Received:** 27 Nov 06  
**Date Expired:** Nov 09  
**Manufacturer:** J.T. Baker  
**Storage Condition:** room temp

**Reagent #:** 201524  
**By:** LMR  
**Matrix:** ag  
**Amount:** 2 x 500ml  
**Lot #:** C31417

| Component | Comment        | Standard | Concentration |
|-----------|----------------|----------|---------------|
|           | VWR # JT6901-5 |          |               |
|           |                |          |               |
|           |                |          |               |
|           |                |          |               |
|           |                |          |               |
|           |                |          |               |

Comment:



Reagent Documentation

Reagent: Ammonium Hydroxide  
 Date Received: 08/02/07  
 Date Expired: 08/02/10  
 Manufacturer: EHD  
 Storage Condition: Room Temp

Reagent #: 201681  
 By: JKZ  
 Matrix: aq  
 Amount: 12 X 100 ml  
 Lot #: 46325720

| Component | Comment                | Standard | Concentration |
|-----------|------------------------|----------|---------------|
|           | <u>Cat # AX1303-11</u> |          |               |
|           |                        |          |               |
|           |                        |          |               |
|           |                        |          |               |
|           |                        |          |               |

Comment:

Reagent: Ascorbic acid  
 Date Received: 03 Aug 07  
 Date Expired: Aug 2012  
 Manufacturer: JT Baker  
 Storage Condition: room temp

Reagent #: 201682  
 By: 9CH  
 Matrix: Solid  
 Amount: 500g  
 Lot #: E18045

| Component | Comment                   | Standard | Concentration |
|-----------|---------------------------|----------|---------------|
|           | <u>JT Baker # 0937-07</u> |          |               |
|           |                           |          |               |
|           |                           |          |               |
|           |                           |          |               |
|           |                           |          |               |

Comment:

Reagent: Buffer pH 10  
 Date Received: 03 Aug 07  
 Date Expired: Dec 2008  
 Manufacturer: BDH  
 Storage Condition: room temp

Reagent #: 201683  
 By: 9CH  
 Matrix: aq  
 Amount: 20L  
 Lot #: 1706759

| Component | Comment                  | Standard | Concentration |
|-----------|--------------------------|----------|---------------|
|           | <u>VWR # BDH0190-20L</u> |          |               |
|           |                          |          |               |
|           |                          |          |               |
|           |                          |          |               |
|           |                          |          |               |

Comment: