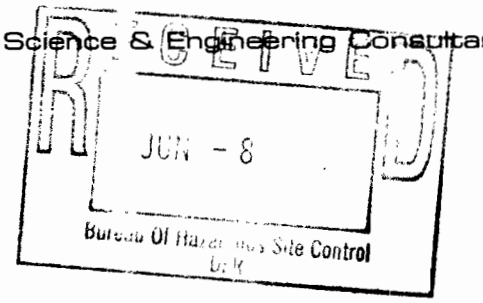
**Lawler, Matusky & Skelly Engineers LLP**

Environmental Science & Engineering Consultants




June 6, 2000
File No. 650-395

Mr. Carl Hoffman
New York State Department of Environmental Conservation
Operation and Maintenance Section - Bureau of Hazardous Site Control
Division of Environmental Remediation
50 Wolf Road
Albany, New York 12233-7010

Re: **Servall Laundry Site**
**Bay Shore, Suffolk County**
**Site No. 1-52-077, Work Assignment No. D002676-39.2**
**Monthly Report – APRIL 2000**

Dear Mr. Hoffman:

Attached please find the Monthly Report for April 2000, the sixth monthly report submitted under Work Assignment No. D002676-39.2.

The plant operated at an average flow rate of 159 gpm for the month and a total volume of 3,862,440 gallons of water was processed. The influent VOC concentration was 145.45 ppb; the plant removed approximately 97.8% of the influent VOCs. Effluent concentrations of total VOCs, manganese and iron were within discharge limitations. Influent compliance data has revealed that MTBE is present at concentrations of 8.8 ppb. The presence of MTBE, a gasoline additive, is indicative of a gasoline spill and not typically found at a site impacted by dry cleaner operations. This may indicate that groundwater contained within the extraction system's radius of influence is impacted by a nearby gasoline spill. Effluent MTBE concentration in April 2000 was 0.5 ppb. Currently, there is no guidance value for MTBE concentrations in groundwater. Historically, a guidance concentration of 50 ppb was used but this is under re-evaluation. Pursuant to our conversation last week, LMS and H2M are proceeding with an investigation to determine the cause of the frequent air compression shutdowns. As soon as results are available we will forward them to you.

LMS will continue to provide task management of the plant operations until September 30, 2000 unless otherwise directed by the NYSDEC. If you have any questions or comments please feel free to contact me at x 249.

Very Truly Yours,

Robert DeGiorgio, P.E.
Project Manager

Enclosures


ONE BLUE HILL PLAZA • P.O. BOX 1509 • PEARL RIVER, NY 10965
(914) 735-8300 • FACSIMILE (914) 735-7466 • WEBSITE: WWW.LMSENG.COM

Servall Laundry Site
Site No. 1-52-077
Groundwater Remediation
Operation and Maintenance

# Monthly Operations Report

April-00

**LAWLER, MATUSKY & SKELLY ENGINEERS LLP**
Environmental Science & Engineering Consultants
One Blue Hill Plaza
Pearl River, New York 10965

650-395

Servall Laundry Site
Site No. 1-52-077
Groundwater Remediation
Operation and Maintenance

Monthly Operations Report

Summary Report
Compliance Sampling
Graphical Data Trends
Summary Notes and Action Items
H2M Reports

**LAWLER, MATUSKY & SKELLY ENGINEERS LLP**
Environmental Science & Engineering Consultants
One Blue Hill Plaza
Pearl River, New York 10965

650-395

Servall Laundry
Site No. 1-52-077
Groundwater Remediation -2000 Operation and Maintenance

Summary Report

| Plant Operating Data | unit | Monthly Average (to date) | January-00 | February-00 | March-00 | April-00 | Total 2000 |
|---|---|---|---|---|---|---|---|
| Flow Rate | gpm | 108 | 160.44 | 160.39 | 160.2 | 158.57 | - |
| Gallons processed | gallons | 3,724,217 | 4,154,420 | 5,390,400 | 3,744,760 | 3,862,440 | 17,152,020 |
| Percent of Time Operating | % | 57% | 62% | 86% | 56% | 60% | - |
| Influent VOC concentration | ug/L | 118 | 63.9 | 100.3 | 150.6 | 145.45 | - |
| Effluent VOC concentration | ug/L | 1.94 | 1.5 | 2 | 6.1 | 3.22 | - |
| VOC removal efficiency | % | 97.5% | 97.7% | 98.0% | 95.9% | 97.8% | |
| Pounds of VOCs Treated | lb | 4.4 | 2.16 | 4.42 | 4.51 | 4.58 | 16 |
| Influent Total Iron | ug/L | 522 | 1270 | 308 | 689 | 426 | - |
| Influent Total Manganese | ug/L | 442 | 593 | 542 | 517 | 499 | - |
| Effluent Total Iron | ug/L | 76 | 100 | 32 | 32 | 75.5 | - |
| Effluent Total Manganese | ug/L | 561 | 583 | 533 | 492 | 506 | - |
| Total Iron removal efficiency | % | 77.6% | 92.1% | 89.6% | 95.4% | 82.3% | - |
| Total Manganese removal efficiency | % | 1.1% | 1.7% | 1.7% | 4.8% | -1.4% | - |
| Sodium hypochlorite (12%) | lb | 676 | 500 | 500 | 500 | 500 | 2,000 |
| Polymer | lb | 33 | 0 | 0 | 0 | 0 | 0 |
| Hydrogen peroxide (50%) | lb | 3453 | 4538 | 4538 | 4538 | 4538 | 18,153 |
| Caustic (50%) | lb | 1581 | 5534 | 5534 | 5534 | 5534 | 22,134 |
| Hydrochloric Acid | lb | 86 | 0 | 0 | 0 | 0 | 0 |
| Cartridge Filters | ea | 1 | 3 | 0 | 0 | 0 | 3 |
| Spare Parts or other | at cost | $582 | $196 | $0 | $0 | $0 | $196 |
| *Consumables cost* | *$* | *$3,126* | *$4,162* | *$3,516* | *$3,516* | *$3,516* | *$14,710* |
| Sludge generated (20% dewatered) | gal | 25 | 25 | 25 | 25 | 25 | 100 |
| Sludge disposed of | gal | 24 | 0 | 0 | 0 | 0 | 0 |
| *Sludge disposal cost* | *$* | *$66.17* | *$0.00* | *$0.00* | *$0.00* | *$0.00* | *$0.00* |
| Gas (estimated) | therms | 871 | 800 | 800 | 800 | 800 | 3,200 |
| Electricity (estimated) | kw hr | 40908 | 37,800 | 37,800 | 37,800 | 37,800 | 151,200 |
| *Utilities cost* | *$* | *$3,987* | *$3,682* | *$3,682* | *$3,682* | *$3,682* | *$14,728* |
| Compliance Sampling | at cost | $969.09 | $655.50 | $650.00 | $650.00 | $650.00 | $2,606 |
| Redevelopment | at cost | $2,688 | $0.00 | $0.00 | $0.00 | $0.00 | $0 |
| Operator | Month | $9,661 | $5,790 | $6,500 | $4,000 | $5,000 | $21,290 |
| Management & Engineering | at cost | $3,244 | $931 | $1,239.99 | $1,200.00 | $856.00 | $4,227 |
| *Services cost* | *$* | *$16,562* | *$7,376* | *$8,390* | *$5,850* | *$6,506* | *$28,122* |
| ***Operating Cost (Estimated)*** | ***$*** | ***$23,740*** | ***$15,221*** | ***$15,588*** | ***$13,048*** | ***$13,704*** | ***$57,561*** |

# Servall Laundry Site
# Site No. 1-52-077
# Groundwater Remediation - Operation and Maintenance

## 2000 Compliance Sampling

| **Influent** | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Constituents | Discharge Criteria | units | January | | February | | March | | April | | May | | June | |
| Chlorobenzene | 5 | ug/L | | U | | | | U | | U | | | | |
| Vinyl Chloride | 2 | ug/L | | U | | | | U | | U | | | | |
| 1,1-Dichloroethene | 5 | ug/L | 0.1 | J | | | | U | | U | | | | |
| Trichloroethene | 5 | ug/L | 1 | | 1 | | 1 | | 1 1 | | | | | |
| Tetrachloroethene | 5 | ug/L | 54 | E | 87 | | 140 | E | 130 | E | | | | |
| 1,1-Dichloroethane | 5 | ug/L | 0.2 | J | | | | U | | U | | | | |
| Toluene | 5 | ug/L | | U | 0.5 | | | U | | U | | | | |
| cis-1,2-Dichloroethene | 5 | ug/L | 0.3 | J | 0.6 | | 0.8 | | 0.6 | | | | | |
| trans-1,2-Dichloroethene | 5 | ug/L | | U | | | | U | | U | | | | |
| Methylene Chloride | N/A | ug/L | | U | 1.6 | JD | | U | 2.6 | JDB | | | | |
| 1,1,1-Trichloroethane | N/A | ug/L | 0.5 | | | | | U | 0.4 | J | | | | |
| Chloroform | N/A | ug/L | 0.2 | J | 0.2 | | | U | 1.9 | JDB | | | | |
| Bromodichloromethane | N/A | ug/L | | U | | | | U | | U | | | | |
| Trichlorofluoromethane | N/A | ug/L | | U | | | | U | | U | | | | |
| Methyl tert-Butly Ether | N/A | ug/L | 7.6 | | 9.4 | | 8.8 | | 8 8 | J | | | | |
| **Total VOCs** | **N/A** | **ug/L** | **63.9** | | **100.3** | | **150.6** | | **145.5** | | | | | |
| | | | | | | | | | | | | | | |
| Iron (total) | 600[4] | ug/L | 1270 | | 308 | | 689 | | 426 | | | | | |
| Manganese (total) | 600[4] | ug/L | 593 | | 542 | | 517 | | 499 | | | | | |
| Alkalinity | N/A | mg/L | 27 | | 29 | | 16 | | 15 | | | | | |
| Total Suspended Solids | N/A | mg/L | 10 | U | 10 | U | 10 | U | 5 | U | | | | |
| Total Solids | N/A | mg/L | 159 | | 162 | | 145 | | 156 | | | | | |
| | | | | | | | | | | | | | | |

| **Effluent** | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Constituents | Discharge Criteria | units | January | | February | | March | | April | | May | | June | |
| Chlorobenzene | 5 | ug/L | | U | | | | U | | U | | | | |
| Vinyl Chloride | 2 | ug/L | | U | | | | U | | U | | | | |
| 1,1-Dichloroethene | 5 | ug/L | | U | | | | U | | U | | | | |
| Trichloroethene | 5 | ug/L | | U | | | | U | | U | | | | |
| Tetrachloroethene | 5 | ug/L | 0.7 | | 1.4 | | 4.2 | | 2.4 | | | | | |
| 1,1-Dichloroethane | 5 | ug/L | | U | | | | U | | U | | | | |
| Toluene | 5 | ug/L | | U | 0.2 | JB | | U | | U | | | | |
| cis-1,2-Dichloroethene | 5 | ug/L | | U | | | | U | | U | | | | |
| trans-1,2-Dichloroethene | 5 | ug/L | | U | | | | U | | U | | | | |
| Methylene Chloride | N/A | ug/L | | U | | | | U | 0.2 | JB | | | | |
| 1,1,1-Trichloroethane | N/A | ug/L | 0.3 | J | | | | U | | U | | | | |
| Chloroform | N/A | ug/L | 0.3 | J | | | 0.7 | B | 0.1 | JB | | | | |
| Bromodichloromethane | N/A | ug/L | 0.2 | J | | | 0.4 | J | | U | | | | |
| Methyl tert-Butly Ether | N/A | ug/L | | U | 0.4 | | 0.8 | | 0.5 | J | | | | |
| **Total VOCs** | **N/A** | **ug/L** | **1.5** | | **2** | | **6.1** | | **3.2** | | | | | |
| | | | | | | | | | | | | | | |
| Iron (total) | 600[4] | ug/L | 100 | | 32 | | 32 | U | 75.5 | B | | | | |
| Manganese (total) | 600[4] | ug/L | 583 | | 533 | | 492 | | 506 | | | | | |
| Alkalinity | N/A | mg/L | 2 | U | 38 | | 41 | | 43 | | | | | |
| Total Suspended Solids | N/A | mg/L | 10 | U | 10 | U | 10 | U | 5 | U | | | | |
| Total Solids | N/A | mg/L | 170 | | 171 | | 163 | | 183 | | | | | |

Notes:

1. Analytical data analyzed by STL Laboratories.

2 (U) Undetected.

3 (J) Estimate value. Result is below sample practical quantitation limit, but above the instrument detection limit

4 The combined effluent concentration of Iron and Manganese will not exceed 1,000 ug/L.

5 N/A - No limit established for this site

6 (E) Estimate value.

7 N-A - Not Analyzed

8 "-" indicates not performed.

9. Bold values exceed discharge limits.

10. (P) pestiside/aroclor target analyte. Greater than 25% difference between the two GC columns.

11 Concentration between EPA contract detection limit and instrument detection limit

Servall Laundry Site
Site No. 1-52-077
Groundwater Remediation - Operation and Maintenance

Graphical Data Trends

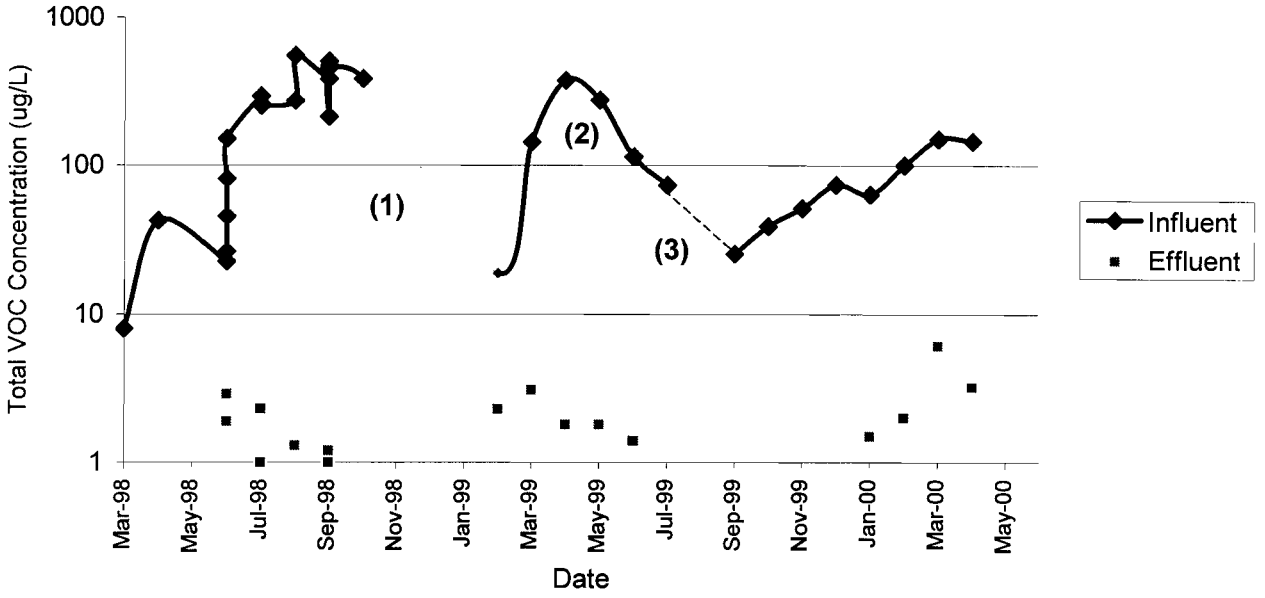



**Figure 1 - Total Volatile Organic Compound (VOC) Influent and Effluent Trends**

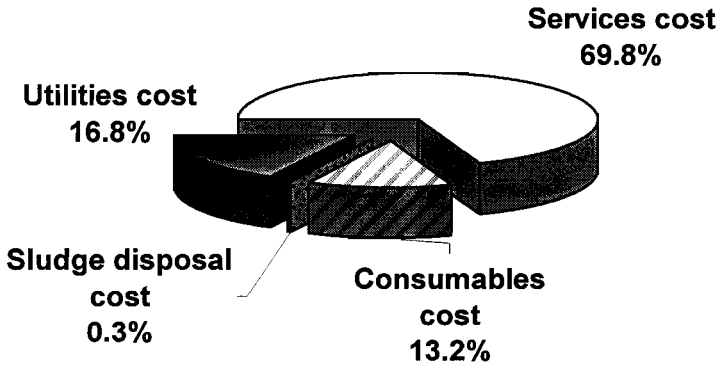



**Figure 2 - Monthly Average Operating Cost Breakdown - to date is $23,740**
**Avg. Monthly operating costs in the Year 2000 is $14,390**

NOTES
1. Plant down due to reinjection well fouling (November 19, 1998 to January 23, 1999)
2. Brief Shut down in May: May 8- May 10,1999
3. Low influent flow due to reinjection well fouling.

**Servall Laundry**
**Site No. 1-52-077**
**Groundwater Remediation - Operations and Maintenance Costs to Date**

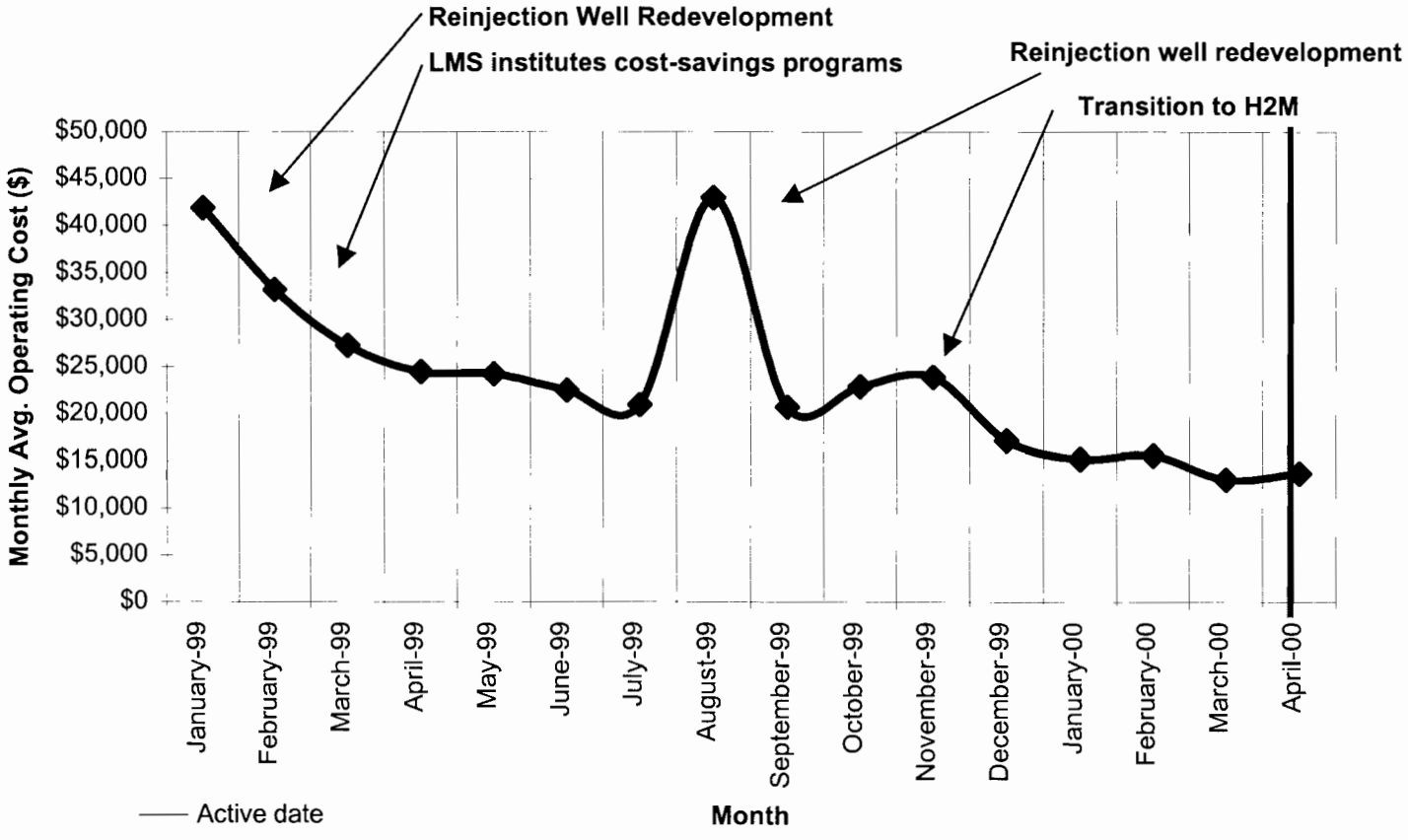



**Figure 3 - Average Operating Cost Trends (Estimated)**

Servall Laundry Site
Site No. 1-52-077
Groundwater Remediation

## Summary Notes and Action Items

| Month | Notes | Action | Resolutions |
|---|---|---|---|
| January | None | | |
| February | MTBE detected, indicative of a gasoline spill unrelated to Servall site | | |
| March | Increase in PCE concentration. Air compressor circuit trip was often | Effluent concentrations below effluent limit. | Recommend the air compressor circuit is re-designed to prevent frequent faults. NYSDEC to respond. |
| April | None | | |
| May | | | |
| June | | | |
| July | | | |
| August | | | |
| September | | | |
| October | | | |
| November | | | |
| December | | | |

H2MGROUP
Holzmacher, McLendon & Murrell, P.C. • H2M Associates, Inc.
H2M Construction Management, Inc. • H2M Labs, Inc.

ACEC Member
Supporting Excellence
In Engineering

575 Broad Hollow Road, Melville, NY 11747-5076
(516) 756-8000 • Fax: (516) 694-4122

May 25, 2000

Robert J. DiGiorgio
Lawler, Matusky, & Skelly Engineers, LLP
One Blue Hill Plaza
Pearl River, NY 10965

Re: Servall Laundry QWETP
Bay Shore, New York
April 2000 Operations Report

Dear Mr. DeGiorgio:

As you are aware, Holzmacher, McLendon, & Murrell, P.C. (H2M) is currently conducting the daily operation and maintenance duties for the above referenced site. A summary of activity with respect to the groundwater extraction and treatment plant for the month of April 2000 is provided below.

**Overview**
Routine equipment maintenance was performed and daily process equipment readings were collected during the month.

**Event Schedule**
The following timeline represents specific tasks completed during the month of April.

- 4/3/00 System went off-line. The air compressor circuit breaker was reset to correct.
- 4/4/00 System went off-line. The air compressor and sand feed filter pump circuit breakers were reset to correct.

  Clean effluent filters were installed into their respective tanks.
- 4/5/00 System went off-line. The air compressor circuit breaker was reset to correct.
- 4/6/00 System went off-line. The air compressor and sand feed filter pump circuit breakers were reset to correct.

- 4/7/00 System went off-line. The air compressor circuit breaker was reset to correct.

- 4/24/00 System went off-line. The air compressor circuit breaker was reset to correct.

  Clean effluent filters were installed into their respective tanks.

- 4/25/00 System went off-line. The air compressor circuit breaker was reset to correct.

- 4/26/00 Clean effluent filters were installed into their respective tanks.

- 4/27/00 System went off-line. The air compressor circuit breaker was reset to correct.

  The monthly water compliance samples were collected, packed in ice, and shipped to Severn-Trent Laboratories via Federal Express, overnight delivery.

- 4/28/00 Available treatment chemical volumes as of the end of ~~March~~ April, 2000 are approximated as follows:

| Tank | Level | Volume |
|---|---|---|
| Acid | 54 in. | 2644 gal |
| Caustic | 4 in. | 195 gal |
| Peroxide | 42 in. | 2056 gal |

**Plant Performance**

Between March 31, 2000 and April 28, 2000, the treatment plant discharged 3,862,440 gallons of treated water. The average flowrate of the UV/Oxidation system was 158.57 gallons per minute during operating conditions. Operational data and daily chemistry records for the respective monitoring period have been included as an attachment to this report.

**Waste Disposal**

No waste was shipped off-site during the reporting period.

H2M GROUP

If you should have any questions or require additional information, please contact Philip Schade at (631) 756-8000, extension 1623.

Very truly yours,

**HOLZMACHER, McLENDON, & MURRELL, P.C.**

Philip J. Schade, P.E.
Project Manager

David Nadler
Environmental Scientist

DWN/

enclosures
cc: Gary J. Miller, P.E./H2M

H2MGROUP

Daily Operation Check List
Servall Laundry Site



| Day | Tuesday | Wednesday | Thursday | Friday | Monday | Tuesday | Wednesday | Thursday | Friday | Monday |
|---|---|---|---|---|---|---|---|---|---|---|
| Date | 3/21/00 | 3/22/00 | 3/23/00 | 3/24/00 | 3/27/00 | 3/28/00 | 3/29/00 | 3/30/00 | 3/31/00 | 4/3/00 |
| Time | ~~56.1~~ 8:30 | ~~56.2~~ 8:15 | 8:20 | 8:40 | 8:55 | 9:05 | 8:40 | 8:35 | 8:50 | 9:00 |
| Extraction Well Level (feet) | 56.1 | 56.2 | 58.9 | 59.9 | 57.2 | 66.3 | 59.5 | 57.7 | 58.3 | 60.2 |
| Influent Flow Rate (gpm) | 157.29 | 158.32 | 165.30 | 160.17 | 164.32 | 169.28 | 161.20 | 165.38 | 161.24 | 167.73 |
| Influent Filter in Service (yes/no) | no | no | no | no | no | no | no | no | no | no |
| Inlet Pressure (psi) | 20 | 20 | 15 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Outlet Pressure (psi) | 18 | 18 | 15 | 15 | 16 | 16 | 16 | 18 | 16 | 16 |
| Cartridge Filter Flow Rate (gpm) | 146.61 | 148.08 | 145.35 | 144.38 | 145.88 | 144.19 | 144.37 | 145.72 | 144.39 | 144.70 |
| Equalization Tank | | | | | | | | | | |
| Level (inches) | 51.89 | 52.03 | 53.12 | 52.72 | 53.27 | 52.33 | 52.86 | 51.87 | 52.66 | 50.99 |
| pH | 7.44 | 7.46 | 7.89 | 7.88 | 7.79 | 7.81 | 7.88 | 7.85 | 7.79 | 7.69 |
| Mixer (on/off) | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| Acid Pump Settings: Speed / Stroke | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| UV/Oxidation Pump in Service (4A/4B) | 4A | 4A | ~~4A~~ 4B | 4B | 4B | 4B | 4B | 4B | 4B | 4B |
| UV/Oxidation Flow Rate (gpm) | 155.81 | 156.45 | 177.58 | 168.37 | 171.23 | 173.41 | 172.39 | 171.61 | 172.53 | 172.19 |
| UV/Oxidation Unit | | | | | | | | | | |
| Lamp # 1 (on/off) | on | on | on | on | on | on | on | on | on | on |
| KV | ~~258~~ 252 | ~~258~~ 252 | 252 | 252 | 252 | 252 | 252 | 252 | 252 | ~~on~~ 252 |
| Amps | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 |
| Time | 10490.27 | 10506.40 | 10507.56 | 10510.51 | 10524.22 | 10533.02 | 10538.04 | 10544.17 | 10550.33 | 10558.33 |
| Lamp # 2 (on/off) | OFF | off | OFF | OFF | OFF | OFF | OFF | OFF | OFF | off |
| KV | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Amps | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Time | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 |
| Lamp # 3 (on/off) | on | on | on | on | on | on | on | on | on | on |
| KV | 258 | 258 | 258 | 258 | 258 | 258 | 258 | 258 | 258 | 258 |
| Amps | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 |
| Time | 8926.27 | 8933.67 | 8934.85 | 8937.76 | 8951.41 | 8960.01 | 8965.22 | 8971.30 | 8985.64 | 8988.64 |
| Peroxide Pump Settings: Speed / Stroke | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 |
| Peroxide Residual Concentration (mg/l) | 14 | 13 | 16 | 15 | 14 | 15 | 14 | 13 | 14 | 15 |
| Totalizer Reading (gpm) | 84106100 | 84217410 | 84227900 | 84250450 | 84250900 | 84261100 | 84388430 | 84400830 | 84409110 | 84418770 |

H2MGROUP

Daily Operation Check List

Servall Laundry Site



| Date | 3/21/00 | 3/22/00 | 3/23/00 | 3/24/00 | 3/27/00 | 3/28/00 | 3/29/00 | 3/30/00 | 3/31/00 | 4/3/00 |
|---|---|---|---|---|---|---|---|---|---|---|
| pH Adjust Tank | | | | | | | | | | |
| Level (inches) | 51.67 | 52.11 | 52.50 | 53.02 | 52.61 | 52.71 | 53.08 | 52.93 | 51.87 | 52.90 |
| pH | 6.72 | 6.68 | 6.63 | 6.70 | 6.70 | 6.68 | 6.72 | 6.83 | 6.90 | 6.79 |
| Mixer (on/off) | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON |
| Caustic Pump Settings: Speed / Stroke | 50/45 | 50/45 | 50/45 | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 |
| Polmer Feed Settings | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Off | OFF | off |
| Solution Pump: Speed / Stroke | | | | | | | | | | |
| Dilution Water Rate | | | | | | | | | | |
| Polymeer Bucket Weight (lbs.) | | | | | | | | | | |
| Sand Filter Feed Pump in Service (6A/6B) | 6B | 6B | 6A | 6B | 6B | 6A | 6A | 6A | 6A | 6B |
| Sand Filters | | | | | | | | | | |
| Filter # 1 inlet pressure (psi) | 20 | 20 | 32 | 20 | 24 | 22 | 20 | 20 | 22 | 24 |
| Filter #1 outlet pressure (psi) | 20 | 22 | 36 | 22 | 22 | 22 | 22 | 20 | 22 | 20 |
| Filter # 2 inlet pressure (psi) | 22 | 20 | 32 | 20 | 22 | 25 | 20 | 20 | 20 | 22 |
| Filter #2 outlet pressure (psi) | 20 | 20 | 38 | 22 | 24 | 22 | 20 | 20 | 22 | 22 |
| Filter # 3 inlet pressure (psi) | 22 | 22 | 38 | 22 | 20 | 24 | 20 | 22 | 20 | 24 |
| Filter #3 outlet pressure (psi) | 20 | 22 | 36 | 22 | 24 | 22 | 20 | 22 | 22 | 20 |
| Filter # 4 inlet pressure (psi) | 22 | 20 | 35 | 22 | 24 | 22 | 20 | 20 | 22 | 20 |
| Filter #4 outlet pressure (psi) | 20 | 20 | 38 | 20 | 22 | 22 | 18 | 22 | 20 | 20 |
| Effluent Flow Rate (gpm) | 146.71 | 145.81 | 145.44 | 146.23 | 147.62 | 149.24 | 148.22 | 143.20 | 142.28 | 141.12 |
| Effluent Filter in Service (yes/no) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | YES | Yes |
| Inlet Pressure (psi) | 25 | 26 | 30 | 28 | 26 | 16 | 16 | 18 | 16 | 16 |
| Outlet Pressure (psi) | 10 | 10 | 15 | 15 | 15 | 10 | 10 | 10 | 10 | 10 |
| Reinjection Well Level (feet) | 60.99 | 61.42 | 61.38 | 62.33 | 61.20 | 62.71 | 61.45 | 62.38 | 61.47 | 61.33 |
| Chemical Storage Levels | | | | | | | | | | |
| Caustic Level (NaOH) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Peroxide Level ($H_2O_2$) | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 |
| Acid Level ($H_2SO_4$) | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 |
| Air Compressor (psi) | 150 | 140 | 150 | 140 | 140 | 140 | 150 | 140 | 150 | 150 |
| Compressed Air Dryer (on/off) | on | on | on | on | on | on | ON | ON | ON | ON |
| Chlorine Pump: Speed / Stroke | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 |
| Chlorine Residual Concentration (mg/l) | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.1 |

H2MGROUP

Daily Operation Check List

Servall Laundry Site



| Day | Tuesday | Wednesday | Thursday | Friday | Monday | Tuesday | Wednesday | Thursday | Friday | Monday |
|---|---|---|---|---|---|---|---|---|---|---|
| Date | 4/18/00 | 4/19/00 | 4/20/00 | 4/21/00 | 4/24/00 | 4/25/00 | 4/26/00 | 4/27/00 | 4/28/00 | 5/01/00 |
| Time | 12:00 | 8:30 | 9:05 | 13:30 | 13:40 | 8:10 | 9:05 | 8:30 | 8:35 | 8:45 |
| Extraction Well Level (feet) | 65.6 | 58.9 | 60.2 | 59.7 | 53.7 | 54.2 | 56.1 | 53.9 | 54.2 | 54.3 |
| Influent Flow Rate (gpm) | 160.01 | 161.23 | 160.33 | 159.87 | 161.22 | 160.22 | 159.37 | 158.71 | 159.13 | 160.48 |
| Influent Filter in Service (yes/no) | no | no | no | no | no | no | no | no | no | no |
| Inlet Pressure (psi) | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Outlet Pressure (psi) | 18 | 16 | 16 | 16 | 16 | 18 | 18 | 16 | 18 | 18 |
| Cartridge Filter Flow Rate (gpm) | 140.20 | 141.91 | 140.38 | 140.92 | 141.93 | 142.91 | 143.74 | 142.61 | 142.24 | 143.57 |
| Equalization Tank | | | | | | | | | | |
| Level (inches) | 51.90 | 51.88 | 52.10 | 52.02 | 51.89 | 52.61 | 52.39 | 53.12 | 51.98 | 52.19 |
| pH | 7.67 | 7.65 | 7.67 | 7.68 | 7.65 | 7.80 | 7.91 | 7.88 | 7.87 | 7.79 |
| Mixer (on/off) | OFF | OFF | OFF | OFF | OFF | OFF | off | OFF | off | off |
| Acid Pump Settings: Speed / Stroke | OFF | OFF | OFF | OFF | OFF | OFF | off | OFF | off | off |
| UV/Oxidation Pump in Service (4A/4B) | 4B | 4B | 4B | 4B | 4B | 4B | 4B | 4B | 4A | 4A |
| UV/Oxidation Flow Rate (gpm) | 150.07 | 151.21 | 150.91 | 152.89 | 153.72 | 152.11 | 151.72 | 156.28 | 154.53 | 153.11 |
| UV/Oxidation Unit | | | | | | | | | | |
| Lamp # 1 (on/off) | on | on | ON | ON | ON | ON | on | ON | ON | ON |
| KV | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 |
| Amps | 252 | 252 | 252 | 252 | 252 | 252 | 252 | 252 | 252 | 252 |
| Time | 10,815.36 | 10841.79 | 10865.81 | 10888.19 | 10893.27 | 10899.50 | 10914.12 | 10918.23 | 10922.51 | 10924.60 |
| Lamp # 2 (on/off) | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| KV | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Amps | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Time | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 |
| Lamp # 3 (on/off) | ON | ON | ON | ON | ON | ON | on | on | ON | on |
| KV | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Amps | 258 | 258 | 258 | 258 | 258 | 258 | 258 | 258 | 258 | 258 |
| Time | 9242.62 | 9269.04 | 9293.06 | 9315.45 | 9320.56 | 9326.73 | 9340.35 | 9340.46 | 9344.72 | 9346.81 |
| Peroxide Pump Settings: Speed / Stroke | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 |
| Peroxide Residual Concentration (mg/l) | 12 | 12 | 11 | 12 | 11 | 12 | 12 | 11 | 13 | 12 |
| Totalizer Reading (gpm) | 86994880 | 87232190 | 87410490 | 87650220 | 87691590 | 87752210 | 87837190 | 87887540 | 87937860 | 88092210 |

H2MGROUP

Daily Operation Check List

Servall Laundry Site



| Date | 4/18/00 | 4/19/00 | 4/20/00 | 4/21/00 | 4/24/00 | 4/25/00 | 4/26/00 | 4/27/00 | 4/28/00 | 5/01/00 |
|---|---|---|---|---|---|---|---|---|---|---|
| pH Adjust Tank | | | | | | | | | | |
| Level (inches) | 50.33 | 51.10 | 52.00 | 50.00 | 51.33 | 50.93 | 51.23 | 50.87 | 51.20 | 52.73 |
| pH | 6.77 | 6.78 | 6.78 | 6.79 | 6.72 | 6.79 | 6.80 | 6.78 | 6.78 | 6.73 |
| Mixer (on/off) | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON |
| Caustic Pump Settings: Speed / Stroke | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 |
| Polmer Feed Settings | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| Solution Pump: Speed / Stroke | | | | | | | | | | |
| Dilution Water Rate | | | | | | | | | | |
| Polymeer Bucket Weight (lbs.) | | | | | | | | | | |
| Sand Filter Feed Pump in Service (6A/6B) | 6A | 6A | 6A | 6A | 6A | 6A | 6A | 6A | 6B | 6B |
| Sand Filters | | | | | | | | | | |
| Filter # 1 inlet pressure (psi) | 20 | 20 | 20 | 20 | 22 | 20 | 20 | 22 | 20 | 20 |
| Filter #1 outlet pressure (psi) | 18 | 20 | 18 | 22 | 22 | 22 | 18 | 20 | 22 | 20 |
| Filter # 2 inlet pressure (psi) | 20 | 20 | 20 | 22 | 20 | 22 | 22 | 20 | 22 | 22 |
| Filter #2 outlet pressure (psi) | 20 | 18 | 22 | 20 | 20 | 20 | 22 | 18 | 20 | 22 |
| Filter # 3 inlet pressure (psi) | 20 | 20 | 20 | 20 | 20 | 22 | 20 | 20 | 20 | 20 |
| Filter #3 outlet pressure (psi) | 20 | 22 | 22 | 22 | 20 | 22 | 20 | 20 | 20 | 20 |
| Filter # 4 inlet pressure (psi) | 22 | 20 | 22 | 20 | 22 | 20 | 22 | 22 | 22 | 20 |
| Filter #4 outlet pressure (psi) | 22 | 22 | 20 | 20 | 20 | 22 | 20 | 20 | 22 | 22 |
| Effluent Flow Rate (gpm) | 146.31 | 145.70 | 142.73 | 139.47 | 142.22 | 143.71 | 144.11 | 145.66 | 144.52 | 143.88 |
| Effluent Filter in Service (yes/no) | Yes | yes | yes | Yes | yes | yes | yes | yes | yes | yes |
| Inlet Pressure (psi) | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Outlet Pressure (psi) | 16 | 15 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 16 |
| Reinjection Well Level (feet) | 68.39 | 68.09 | 67.94 | 68.34 | 67.31 | 68.22 | 67.91 | 66.34 | 68.20 | 68.13 |
| Chemical Storage Levels | | | | | | | | | | |
| Caustic Level (NaOH) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Peroxide Level ($H_2O_2$) | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 |
| Acid Level ($H_2SO_4$) | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 |
| Air Compressor (psi) | 150 | 160 | 150 | 150 | 160 | 140 | 150 | 150 | 150 | 160 |
| Compressed Air Dryer (on/off) | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON |
| Chlorine Pump: Speed / Stroke | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 |
| Chlorine Residual Concentration (mg/l) | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 |

H2MGROUP

Daily Operation Check List

Servall Laundry Site



| Day | Tuesday | Wednesday | Thursday | Friday | Monday | Tuesday | Wednesday | Thursday | Friday | Monday |
|---|---|---|---|---|---|---|---|---|---|---|
| Date | 4/4/00 | 4/5/00 | 4/6/00 | 4/7/00 | 4/10/00 | 4/11/00 | 4/12/00 | 4/13/00 | 4/14/00 | 4/15/00 |
| Time | 8:00 | 8:20 | 9:10 | 7:00 | 8:30 | 8:50 | 8:45 | 8:30 | 8:00 | 9:00 |
| Extraction Well Level (feet) | 60.4 | 61.2 | 60.7 | 60.1 | 59.0 | 59.1 | 59.2 | 57.1 | 58.4 | 65.4 |
| Influent Flow Rate (gpm) | 172.38 | 169.43 | 168.31 | 165.22 | 159.99 | 152.71 | 160.00 | 154.19 | 153.27 | 154.93 |
| Influent Filter in Service (yes/no) | no | no | no | no | no | no | no | no | no | NO |
| Inlet Pressure (psi) | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Outlet Pressure (psi) | 18 | 16 | 16 | 16 | 16 | 15 | 16 | 14 | 14 | 16 |
| Cartridge Filter Flow Rate (gpm) | 148.33 | 146.12 | 147.09 | 148.37 | 149.27 | 148.20 | 140.71 | 144.38 | 143.88 | 145.23 |
| Equalization Tank | | | | | | | | | | |
| Level (inches) | 52.07 | 52.11 | 52.19 | 51.99 | 52.00 | 51.83 | 52.07 | 51.93 | 52.01 | 52.61 |
| pH | 7.20 | 7.18 | 7.11 | 7.18 | 7.49 | 7.43 | 7.60 | 7.63 | 7.62 | 7.70 |
| Mixer (on/off) | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | off |
| Acid Pump Settings: Speed / Stroke | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | off |
| UV/Oxidation Pump in Service (4A/4B) | 4B | 4B | 4A | 4A | 4B | 4B | 4B | 4B | 4B | 4B |
| UV/Oxidation Flow Rate (gpm) | 181.23 | 178.64 | 177.42 | 173.29 | 149.78 | 150.11 | 153.94 | 152.93 | 153.11 | 155.31 |
| UV/Oxidation Unit | | | | | | | | | | |
| Lamp # 1 (on/off) | on | on | on | on | on | on | on | on | ON | on |
| KV | 252 | 252 | 252 | 252 | 252 | 252 | 252 | 252 | 252 | 252 |
| Amps | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 | 7.8 |
| Time | 10563.31 | 10570.11 | 10573.12 | 10579.50 | 10625.58 | 10647.63 | 10671.58 | 10695.63 | 10719.30 | 10794.62 |
| Lamp # 2 (on/off) | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | off |
| KV | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Amps | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Time | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 | 5984.86 |
| Lamp # 3 (on/off) | on | on | on | on | on | on | on | on | ON | ON |
| KV | 258 | 258 | 258 | 258 | 258 | 258 | 258 | 258 | 258 | 258 |
| Amps | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Time | 8990.14 | 8997.94 | 9000.95 | 9006.42 | 9052.81 | 9074.86 | 9098.82 | 9119.87 | 9143.55 | 9221.87 |
| Peroxide Pump Settings: Speed / Stroke | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 | 50/50 |
| Peroxide Residual Concentration (mg/l) | 12 | 11 | 12 | 12 | 11 | 12 | 12 | 13 | 12 | 12 |
| Totalizer Reading (gpm) | 84419450 | 84421200 | 84427600 | 84618880 | 85284290 | 85483370 | 85699480 | 85721390 | 85946010 | 86808650 |

H2MGROUP

Daily Operation Check List

Servall Laundry Site



| Date | 4/4/00 | 4/5/00 | 4/6/00 | 4/7/00 | 4/10/00 | 4/11/00 | 4/12/00 | 4/13/00 | 4/14/00 | 4/17/00 |
|---|---|---|---|---|---|---|---|---|---|---|
| pH Adjust Tank | | | | | | | | | | |
| Level (inches) | 51.29 | 52.37 | 53.10 | 52.91 | 50.05 | 51.70 | 49.98 | 50.37 | 51.29 | 52.80 |
| pH | 6.81 | 6.91 | 7.02 | 7.11 | 6.77 | 6.74 | 6.78 | 6.71 | 6.74 | 6.77 |
| Mixer (on/off) | ON | ON | ON | on | on | on | on | on | ON | on |
| Caustic Pump Settings: Speed / Stroke | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 | 50/35 |
| Polmer Feed Settings | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Off |
| Solution Pump: Speed / Stroke | | | | | | | | | | |
| Dilution Water Rate | | | | | | | | | | |
| Polymeer Bucket Weight (lbs.) | | | | | | | | | | |
| Sand Filter Feed Pump in Service (6A/6B) | 6B | 6B | 6A | 6A | 6A | 6A | 6A | 6A | 6A | 6A |
| Sand Filters | | | | | | | | | | |
| Filter # 1 inlet pressure (psi) | 22 | 20 | 24 | 26 | 18 | 18 | 20 | 20 | 20 | 20 |
| Filter #1 outlet pressure (psi) | 20 | 22 | 22 | 24 | 20 | 20 | 20 | 20 | 20 | 20 |
| Filter # 2 inlet pressure (psi) | 22 | 24 | 22 | 28 | 18 | 18 | 20 | 20 | 22 | 20 |
| Filter #2 outlet pressure (psi) | 22 | 22 | 24 | 24 | 20 | 20 | 20 | 20 | 18 | 20 |
| Filter # 3 inlet pressure (psi) | 24 | 22 | 24 | 28 | 18 | 18 | 20 | 20 | 22 | 18 |
| Filter #3 outlet pressure (psi) | 22 | 20 | 22 | 28 | 20 | 20 | 20 | 20 | 20 | 20 |
| Filter # 4 inlet pressure (psi) | 20 | 22 | 24 | 26 | 18 | 18 | 20 | 18 | 22 | 20 |
| Filter #4 outlet pressure (psi) | 20 | 20 | 24 | 28 | 20 | 20 | 20 | 20 | 20 | 22 |
| Effluent Flow Rate (gpm) | 147.10 | 145.71 | 146.82 | 144.81 | 145.01 | 149.33 | 140.73 | 144.41 | 143.72 | 143.51 |
| Effluent Filter in Service (yes/no) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Inlet Pressure (psi) | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| Outlet Pressure (psi) | 10 | 12 | 10 | 10 | 10 | 10 | 10 | 10 | 12 | 10 |
| Reinjection Well Level (feet) | 61.44 | 62.33 | 61.82 | 62.33 | 67.41 | 66.94 | 68.67 | 68.14 | 67.91 | 68.33 |
| Chemical Storage Levels | | | | | | | | | | |
| Caustic Level (NaOH) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Peroxide Level ($H_2O_2$) | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 | 58.3 |
| Acid Level ($H_2SO_4$) | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 | 76.9 |
| Air Compressor (psi) | 150 | 160 | 150 | 160 | 140 | 150 | 150 | 140 | 150 | 140 |
| Compressed Air Dryer (on/off) | on | ON | on | on | on | on | on | on | on | ON |
| Chlorine Pump: Speed / Stroke | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 | 60/85 |
| Chlorine Residual Concentration (mg/l) | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 |

H2MGROUP

**Servall Laundry Process Control Samples**

| Date | 4/3/00 | 4/4/00 | 4/5/00 | 4/6/00 | 4/7/00 | 4/10/00 | 4/11/00 | 4/12/00 | 4/13/00 | 4/14/00 | 4/15/00 | 4/18/00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Time** | 9:30 | 8:30 | 9:00 | 9:30 | 9:20 | 8:55 | 9:30 | 9:15 | 9:05 | 8:35 | 9:25 | 12:20 |
| **Influent** | | | | | | | | | | | | |
| Flow | 167.73 | 172.38 | 169.43 | 168.31 | 165.22 | 159.99 | 152.71 | 160.00 | 154.19 | 153.27 | 154.23 | 160.01 |
| pH | 5.74 | 5.68 | 5.76 | 5.75 | 5.69 | 5.72 | 5.69 | 5.73 | 5.59 | 5.62 | 5.61 | 5.70 |
| Iron | 0.4 | 0.4 | 0.3 | 0.5 | 0.4 | 0.4 | 0.4 | 0.3 | 0.4 | 0.5 | 0.3 | 0.3 |
| **UVOX** | | | | | | | | | | | | |
| Peroxide Residual | 15 | 12 | 11 | 12 | 12 | 11 | 12 | 12 | 13 | 12 | 12 | 12 |
| pH | ~~6.69~~ | 6.04 | 6.03 | 5.99 | 5.97 | 5.93 | 5.96 | 5.99 | 5.88 | 5.84 | 5.91 | 5.96 |
| **Effluent** | | | | | | | | | | | | |
| pH | 7.02 | 7.08 | 6.95 | 7.11 | 7.14 | 7.04 | 7.00 | 6.98 | 7.03 | 7.09 | 6.83 | 6.89 |
| Iron | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 0.3 | 0.2 | 0.3 | 0.2 |
| Chlorine | 0.1 | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | 0.1 |

| Date | 4/19/00 | 4/20/00 | 4/21/00 | 4/24/00 | 4/25/00 | 4/26/00 | 4/27/00 | 4/28/00 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Time** | 9:00 | 9:30 | 14:00 | 14:05 | 9:00 | 9:35 | 9:00 | 9:00 | | | | |
| **Influent** | | | | | | | | | | | | |
| Flow | 161.23 | 160.33 | 159.87 | 161.22 | 160.22 | 159.37 | 158.71 | 159.13 | | | | |
| pH | 5.66 | 5.71 | 5.74 | 5.68 | 5.65 | 5.72 | 5.81 | 5.70 | | | | |
| Iron | 0.4 | 0.3 | 0.4 | 0.5 | 0.3 | 0.3 | 0.4 | 0.4 | | | | |
| **UVOX** | | | | | | | | | | | | |
| Peroxide Residual | 12 | 11 | 12 | 11 | 12 | 12 | 11 | 13 | | | | |
| pH | 6.01 | 6.02 | 6.01 | 5.96 | 5.94 | 5.93 | 5.87 | 5.90 | | | | |
| **Effluent** | | | | | | | | | | | | |
| pH | 6.78 | 6.91 | 7.04 | 7.11 | 7.12 | 7.18 | 7.16 | 7.09 | | | | |
| Iron | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | | | | |
| Chlorine | 0.1 | 0.1 | 0.1 | 0.2 | 0.3 | 0.3 | 0.2 | 0.2 | | | | |