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4 April 2007

Samuel S. Stone
Environmental Affairs Coordinator
Peace River Facility
8998 S.W. County Road 769
Arcadia, FL 31269

RE: Horse Creek Stewardship Program
pH Impact Assessment for January 2007
Developed on behalf of Mosaic in April 2007

Dear Mr. Stone,

The impact assessment you requested for the Horse Creek Stewardship Program January 2007 sampling event is attached. We have found no evidence that Horse Creek actually experienced pH above the trigger levels in January 2007, but instead it appears that the elevated values were the result of equipment error. Please contact us if you have any questions or comments.

Sincerely,

BIOLOGICAL RESEARCH ASSOCIATES

Kristan Robbins
Ecologist

Douglas J. Durbin, Ph.D
Senior Water Resource Analyst/Vice President

Enclosure: pH Impact Assessment January 2007 Exceedance at HCSW-1 and HCSW-4



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pH IMPACT ASSESSMENT JANUARY 2007 EXCEEDANCE AT HCSW-1 AND HCSW-4

Prepared on behalf of:



Prepared by:



April 2007

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Senior Water Resource Analyst/Vice President

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Background

This report was prepared as a component of the Horse Creek Stewardship Program (HCSP). The HCSP plan document requires that an “impact assessment” be conducted for any trigger level exceedances or water quality trends found while preparing the annual HCSP report. However, this assessment is being proactively provided at the request of Sam Stone of the Peace River Manasota Regional Water Supply Authority (PRMRWSA) based on monthly monitoring data not yet incorporated into an annual report.

As part of the HCSP, Mosaic monitors four locations monthly on Horse Creek for a number of water quality parameters. Most of the monitored parameters have trigger levels that are set to track conditions in the stream. The trigger levels for pH are exceeded below 6.0 SU or above 8.5 SU. In January 2007, pH at HCSW-1 at State Road 64 (8.83 SU) and at HCSW-4 at State Road 72 (8.85 SU) associated with the January 2007 water quality sampling exceeded the upper trigger level. In addition, pH at HCSW-2 at Goose Pond Road (7.98 SU) and HCSW-3 at State Road 70 (8.49 SU) was also elevated. All of the HCSP pH sampling data is presented below, as well as provisional data from ambient monitoring conducted by SWFWMD at two of the HCSP stations. Additional pH measurements that were recorded during HCSP biology sampling on 28 March 2007 are also included.

The January 2007 pH values recorded by Mosaic represent the maximum pH levels observed at each HCSP station for the duration of the Stewardship Program that was initiated in April 2003 (Table 1). The previous maximum pH at each station ranged from 7.5 SU at HCSW-3 to 8.1 SU at HCSW-4 (Table 2). The pH measured at each HCSP station during the months prior to and following the January 2007 event were more than 1 SU less than the January 2007 samples (Table 2, Figure 1), a condition not observed previously in nearly 50 months of monitoring .

Table 1. Summary statistics of pH levels at Horse Creek Stewardship Program monthly sampling stations from April 2003 to February 2007.

| | HCSW-1 | HCSW-2 | HCSW-3 | HCSW-4 |
|---------|----------------------|----------------------|----------------------|----------------------|
| | State Road 64 | Goose Pond Rd | State Road 70 | State Road 72 |
| Minimum | 6.18 | 5.95 | 5.91 | 6.03 |
| Median | 6.96 | 6.57 | 6.86 | 6.88 |
| Mean | 6.99 | 6.59 | 6.85 | 6.97 |
| Maximum | 8.83 | 7.98 | 8.49 | 8.85 |

Mosaic Phosphates Company
pH Impact Assessment
January 2007 Exceedance at HCSW-1 and HCSW-4



Table 2. All recorded pH levels at Horse Creek Stewardship Program monthly sampling stations from April 2003 to February 2007.

| Date | HCSW-1 | HCSW-2 | HCSW-3 | HCSW-4 |
|------------|---------------|---------------|---------------|---------------|
| | State Road 64 | Goose Pond Rd | State Road 70 | State Road 72 |
| 4/30/2003 | 6.99 | 6.10 | 7.00 | 6.86 |
| 5/27/2003 | 7.22 | 6.25 | 6.88 | 7.09 |
| 6/19/2003 | 7.10 | 6.31 | 6.65 | 6.84 |
| 7/14/2003 | 7.04 | 6.31 | 6.83 | 6.94 |
| 8/28/2003 | 7.09 | 6.59 | 6.96 | 6.47 |
| 9/25/2003 | 7.21 | 6.45 | 7.03 | 7.09 |
| 10/29/2003 | 7.04 | 6.69 | 6.92 | 6.78 |
| 11/20/2003 | 7.20 | 6.56 | 6.75 | 6.61 |
| 12/16/2003 | 7.05 | 6.50 | 7.10 | 6.76 |
| 1/29/2004 | 7.75 | 6.67 | 7.38 | 7.39 |
| 2/24/2004 | 7.30 | 6.57 | 7.19 | 7.17 |
| 3/16/2004 | 7.13 | 6.62 | 7.04 | 6.92 |
| 4/14/2004 | 7.32 | 6.89 | 7.23 | 7.16 |
| 5/26/2004 | 7.34 | 6.82 | 7.18 | 7.38 |
| 6/29/2004 | 6.76 | 6.36 | 7.22 | 7.46 |
| 7/27/2004 | 6.96 | 6.55 | 6.71 | 6.78 |
| 8/30/2004 | 6.94 | 6.35 | 6.32 | 6.13 |
| 9/29/2004 | 6.59 | 6.45 | 6.45 | 6.57 |
| 10/27/2004 | 6.62 | 6.46 | 6.73 | 7.13 |
| 11/18/2004 | 6.67 | 6.79 | 6.24 | 6.74 |
| 12/15/2004 | 6.60 | 6.13 | 6.45 | 6.49 |
| 1/26/2005 | 7.21 | 6.71 | 6.87 | 6.88 |
| 2/24/2005 | 6.97 | 7.07 | 7.19 | 7.21 |
| 3/30/2005 | 6.96 | 7.63 | 7.11 | 6.99 |
| 4/27/2005 | 6.18 | 6.63 | 6.63 | 6.69 |
| 5/25/2005 | 6.92 | 6.89 | 7.50 | 7.23 |
| 6/22/2005 | 6.45 | 6.09 | 6.00 | 6.03 |
| 7/27/2005 | 6.56 | 6.13 | 5.91 | 6.31 |
| 8/23/2005 | 6.67 | 6.33 | 6.29 | 6.29 |
| 9/29/2005 | 6.62 | 6.39 | 6.72 | 6.82 |
| 10/27/2005 | 6.86 | 6.72 | 7.26 | 7.17 |
| 11/17/2005 | 6.79 | 6.65 | 6.72 | 6.64 |
| 12/20/2005 | 6.84 | 6.84 | 6.80 | 6.74 |
| 1/30/2006 | 6.84 | 6.82 | 7.00 | 7.17 |
| 2/23/2006 | 6.91 | 6.89 | 6.88 | 6.73 |
| 3/28/2006 | 7.37 | 6.84 | 7.27 | 7.69 |
| 4/27/2006 | 7.21 | 7.17 | 7.04 | 7.89 |
| 5/25/2006 | dry | 6.86 | dry | 7.48 |
| 6/29/2006 | 6.95 | 6.70 | 6.81 | 8.10 |
| 7/27/2006 | 6.94 | 5.95 | 6.42 | 6.92 |
| 8/21/2006 | 7.25 | 6.09 | 6.31 | 6.86 |
| 9/27/2006 | 6.89 | 6.18 | 6.28 | 6.40 |
| 10/19/2006 | 6.49 | 5.99 | 6.42 | 6.67 |
| 11/9/2006 | 6.90 | 6.56 | 6.85 | 6.89 |
| 12/13/2006 | 6.54 | 6.31 | 6.69 | 6.84 |
| 1/23/2007 | 8.83 | 7.98 | 8.49 | 8.85 |
| 2/14/2007 | 7.55 | 6.67 | 7.20 | 7.39 |

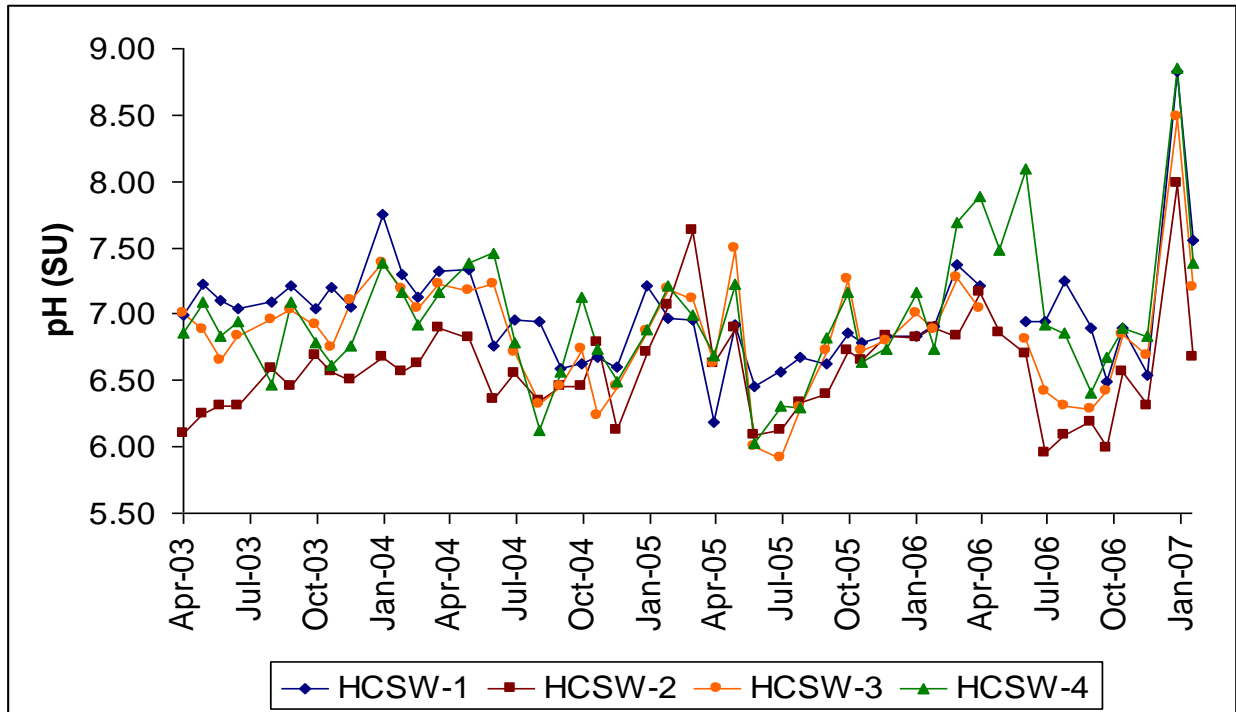


Figure 1. Measured pH at Horse Creek Stewardship Program monthly sampling stations from April 2003 to February 2007.

The Southwest Florida Water Management District (SWFWMD) also conducts ambient monitoring at two sites on Horse Creek for monthly water quality: Horse Creek near Myakka Head (same as HCSW-1) and Horse Creek near Arcadia (same as HCSW-4). SWFWMD visited those sites on 2 January 2007 and 8 February 2007, two dates that bracket the January 2007 HCSP sampling event (Table 3). The pH recorded by SWFWMD during these two events was more than 1.5 SU less than the pH recorded during HCSP sampling in January 2007. The pH recorded during the December 2006 and February 2007 HCSP sampling events was much closer to the values recorded by SWFWMD (Figure 2).

Table 3. Provisional pH data from SWFWMD sampling on Horse Creek in early 2007.

| Date | Horse Creek near Myakka Head | Horse Creek near Arcadia |
|----------|------------------------------|--------------------------|
| | HCSW-1 | HCSW-4 |
| 1/2/2007 | 7.11 | 7.17 |
| 2/8/2007 | 7.26 | 7.27 |

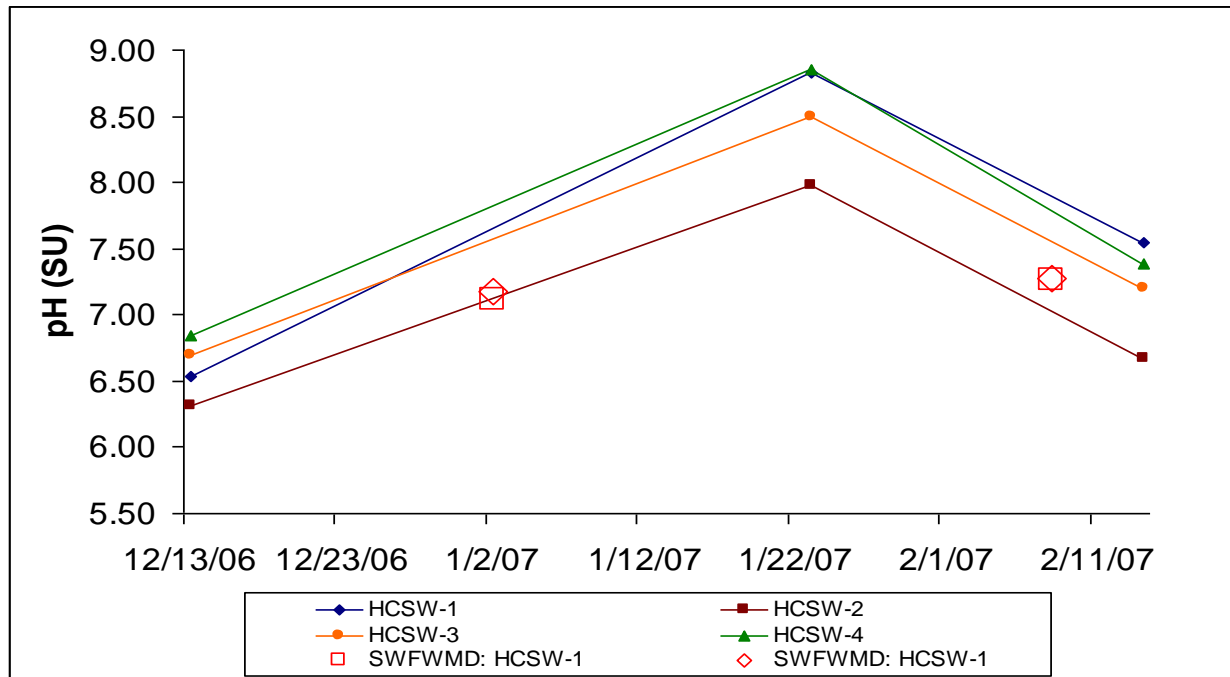


Figure 2. Measured pH at Horse Creek Stewardship Program monthly sampling stations from December 2006 to February 2007, along with provisional SWFWMD sampling from January to February 2007.

In addition to the regular monthly sampling performed by Mosaic and SWFWMD, BRA made pH measurements during a 28 March 2007 biology sampling event. All recorded pH values were well within the HCSP trigger values (Table 4).

Table 4. Recorded pH levels at Horse Creek Stewardship Program sampling stations during 28 March 2007 biology sampling.

| Date | HCSW-1 | HCSW-2 | HCSW-3 | HCSW-4 |
|---------------|---------------|---------------|---------------|---------------|
| | State Road 64 | Goose Pond Rd | State Road 70 | State Road 72 |
| 28 March 2007 | 7.52 | 7.06 | 7.47 | 7.51 |

The history of pH measurements recorded throughout the HCSP, as well as independent measurements taken by SWFWMD or BRA personnel, indicate that the 23 January 2007 HCSP pH measurements are probably incorrect. Those measurements are the highest ever recorded at each HCSP station, and other measurements taken within a few weeks of the 23 January are not nearly as elevated. As shown in Figure 1, occasional, slightly elevated pH values at HCSP stations were usually isolated to one station at a time, but the 23 January 2007 measurements were anomalously elevated at all stations.

An instrument with a faulty pH probe, or one that was calibrated incorrectly, is the most reasonable cause for the anomalous pH measurements reported for all stations sampled that day. Mosaic field technicians have stated that the pH meter used on 23 January 2007 was an older machine that had been heavily-used, but February and March 2007 measurements were taken using a new, recently-serviced machine. Faulty equipment is the most likely cause of elevated pH values for 23 January 2007 and using the new machine will eliminate those errors.

Based on the data presented herein, we find no evidence of biological/chemical causes for elevated pH in Horse Creek in January 2007. Typically, pH as high as 8.5 is seldom found in natural Florida waters. High pH can be observed in eutrophic lakes as algal blooms consume large quantities of carbon dioxide for photosynthesis during the day, thereby reducing the carbonic acid concentration in the water. It is highly unlikely that Horse Creek had an algal bloom on 23 January 2007 that would be large enough to elevate the pH, but not persistent enough to affect the SWFWMD sampling that was conducted in prior and subsequent weeks. Chlorophyll *a* concentrations during the 23 January 2007 HCSP sample were also not elevated. In addition, BRA noticed that filamentous mats of green algae were common during their biological sampling on 28 March 2007 at HCSW-3 and HCSW-4, but pH was not elevated in spite of their presence.

In conclusion, there is no evidence that the elevated pH levels recorded by Mosaic staff in Horse Creek were accurate. Instead, the measurements in question are most likely the result of instrument error. The high pH levels recorded during the January 2007 sampling event are not corroborated by measurements taken before or after that event, and the equipment used during the January 2007 event was replaced because of age. Chlorophyll *a* concentrations, which could indicate a possible biological cause for high pH, were not elevated during the January 2007. In addition, Mosaic has not mined any land in the Horse Creek basin, nor discharged water from mining operations in the basin for more than six months prior to the January 2007 sampling event.