

## **Project Status Report**

**Project:** Horse Creek Stewardship Program

**Date:** February 9, 2012

**Prepared by:** Samuel Stone, Environmental Affairs Coordinator

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The following information is a brief summary of recent activities occurring with the Horse Creek Stewardship Program (HCSP).

### Technical Advisory Group (TAG).

The TAG is scheduled to meet February 29 to review and comment on the draft *Horse Creek Stewardship Program 2010 Annual Report*.

### Monthly Water Quality Monitoring.

This sampling effort by Mosaic has continued without any interruption of collected data. Mosaic has transmitted data to the Authority covering the period April 2003 – Dec 2011. Mosaic continues to voluntarily sample and report data from Brushy Creek.

### Macroinvertebrate and Fish Sampling.

These biological samples were collected during the Spring 2011 time frame on April 18, 2011. Due to stream flow conditions the summer wet season samples were partially collected in Aug 2011. Fall samples were collected on October 26.

### Clay Settling Ponds Real Time Monitoring.

Mosaic has completed modifications to the telemetry equipment and confirmed that data is being transmitted to the Peace River Facility as of June 29, 2010. Mosaic volunteered to add a newly constructed clay settling pond located in the Horse Creek watershed to the monitoring system for a total of three ponds. The Authority has completed the Facility SCADA system modifications to accept this new third clay pond data. Final calibrations and set up of the system are complete.

### Reports.

The draft *Horse Creek Stewardship Program 2010 Annual Report* was transmitted by Mosaic and their consultant Cardno / Entrix to the Authority for review on December 16, 2011. The Authority staff, Authority consultants Earth Balance and the TAG are currently reviewing the report in preparation for the next TAG meeting scheduled for Feb 9.

### Recent Impact Assessments.

May 2011 data showed that the trigger level for ammonia was exceeded at station 4 and an impact assessment has been requested. Mosaic and their consultant Cardno / Entrix are evaluating data and plan on splitting samples between Mosaic and the WMD to help in evaluating the cause for exceeding the trigger level.

## **Project Historical Briefing**

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The HCSP consists of multiple tasks occurring on different schedules. Below is a list of the major tasks, a brief description of the tasks and historical progress on those tasks.

### **Technical Advisory Group (TAG).**

The TAG as required by the HCSP consists of one representative from each member government. The TAG is to review the progress and findings of the program and provide technical input to the Authority. Members of the TAG consist of the following people. William Byle (Charlotte County), DeSoto County currently has no representative, Robert Brown (Manatee County) and John Ryan (Sarasota County). The TAG last met on March 1, 2011 to review the draft *Horse Creek Stewardship Program 2009 Annual Report*.

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This sampling effort by Mosaic was started in April 2003 and has continued monthly without any interruption of collected data. EarthBalance visits the monitoring sites to collect duplicate samples and to collect samples at random to spot check water quality

### **Macroinvertebrate and Fish Sampling.**

This biological sampling effort is required three times per year in Spring (March - April), Summer (July - September) and Fall (October - December). The biological sample locations are the same four fixed stations used for water quality monitoring.

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This component requires that the Authority have the ability to monitor in real time the fluid levels of various clay settling ponds. This system could act as an early warning device for the Peace River Facility staff should an embankment fail, releasing clay material into Horse Creek. In the summer of 2010 Mosaic added real time monitoring to an additional (third) clay settling pond.

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Flow and stage data is collected and monitored at the four fixed water quality sample stations. Stations 1 & 4 have existing USGS stations with data available on the USGS web site. Stations 2 & 3 required the installation of stage level gages and monitoring / reporting by Mosaic.

### Water Quality Continuous Recorder.

The continuous water quality monitoring equipment became operational in July 2003 and is located at the fixed water quality station number 1, closest to mining operations. Monthly this data is down loaded in the field, and placed into a data base. This monitoring effort is on going. This data is supplied as part of the Annual Report and summarized monthly along with other routine water quality data

### Reports.

The QA/QC project report describes the field methods, lab methods, standards and procedures used by Mosaic when implementing the monitoring program. The QA/QC plan will ensure that the HCSP methods used are the standard methods accepted by scientific and regulatory communities, as well as ensure that the results are reliable, reproducible and consistent with other programs.

The Historical Report is an accumulation of existing historical data on Horse Creek. This data was analyzed to determine historical back ground conditions of Horse Creek, determine if any trends are evident and be the basis for comparing with current data collected as part of the HCSP.

The Annual Reports provide all the data collected as part of the HCSP and compares these results with the historical data. The intent is to determine if current water quality is different from the past and if a trend can be determined. Below is Summary Table I showing the progress of the various reports required by the stewardship program.

### Impact Assessments.

As required by the HCSP, if a water quality parameter exceeds a specified trigger value or a significant trend in the data is found, then Mosaic will initiate an impact assessment for the cause of the exceeded level. The assessment can consist of further monitoring, and evaluations within the basin and may result in scientific assistance from Mosaic (if not at fault) or corrective mining actions (if at fault). If the assessment finds Mosaic at fault for the exceeded trigger level or increasing trend then the impact assessment is followed by corrective actions evaluation and implementation. Below is Summary Table II showing the frequency of exceeded trigger levels for the stewardship program.

All previous impact assessments have shown that the trigger levels were exceeded due to other causes not related to mining activities. The most recent event was in January 2011 where station 1 was found to have low pH levels. The impact assessment for this event has been received. The results of that assessment found that the low pH was due to equipment malfunction and was not correlated to mining discharges since mining did not discharge water to Horse Creek during January 2011.

**Summary Table I  
Project Reports**

Report Title	Receive First Draft Report	Receive Final Draft Report	TAG Review	Receive Final Report
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**Summary Table II  
Exceeded Trigger Levels**

<b>Project Period</b>	<b>Station Number</b>	<b>Chemical Parameter</b>	<b>Frequency of Exceeded Trigger Levels (months)</b>
Apr 2003 – Nov 2011 ( 104 months)	1	Dissolved Oxygen	3/104
	1	Color	1/104
	1	pH	2/104
	1	Alkalinity	5/104
	1	Fatty Acid	1/104
	1	Chlorophyll	1/104
	2	Dissolved Oxygen	87/104
	2	pH	2/104
	2	Chlorophyll	16/104
	2	Total Nitrogen	1/104
	2	Radium 226 + 228	1/104
	2	Iron	2/104
	2	Total Ammonia	1/104
	2	Fatty Acid	9/104
	3	Dissolved Oxygen	35/104
	3	Total Nitrogen	2/104
	3	Color	2/104
	3	Total Dissolved Solids	11/104
	3	Dissolved Calcium	5/104
	3	Chlorophyll	1/104
	3	Fatty Acid	1/104
	3	pH	1/104
	3	Total Ammonia	2/104
	3	Sulfate	9/104
	4	pH	1/104
	4	Iron	38/104
	4	Dissolved Oxygen	15/104
	4	Sulfate	15/104
	4	Total Dissolved Solids	17/104
	4	Conductivity	1/104
	4	Dissolved Calcium	8/104
	4	Total Alkalinity	3/104
	4	Total Ammonia	1/104
	4	Fluoride	5/104
	4	Fatty Acid	1/104

## **Project Status Report**

**Project:** Horse Creek Stewardship Program

**Date:** April 4, 2012

**Prepared by:** Samuel Stone, Environmental Affairs Coordinator

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	1	pH	2/106
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	2	Chlorophyll	16/106
	2	Total Nitrogen	1/106
	2	Radium 226 + 228	1/106
	2	Iron	2/106
	2	Total Ammonia	1/106
	2	Fatty Acid	9/106
	3	Dissolved Oxygen	35/106
	3	Total Nitrogen	2/106
	3	Color	2/106
	3	Total Dissolved Solids	13/106
	3	Dissolved Calcium	5/106
	3	Chlorophyll	1/106
	3	Fatty Acid	1/106
	3	pH	1/106
	3	Total Ammonia	2/106
	3	Sulfate	9/106
	4	pH	1/106
	4	Iron	38/106
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	4	Conductivity	1/106
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	4	Total Alkalinity	3/106
	4	Total Ammonia	1/106
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## **Project Status Report**

**Project:** Horse Creek Stewardship Program

**Date:** June 6, 2012

**Prepared by:** Samuel Stone, Environmental Affairs Coordinator

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The QA/QC project report describes the field methods, lab methods, standards and procedures used by Mosaic when implementing the monitoring program. The QA/QC plan will ensure that the HCSP methods used are the standard methods accepted by scientific and regulatory communities, as well as ensure that the results are reliable, reproducible and consistent with other programs.

The Historical Report is an accumulation of existing historical data on Horse Creek. This data was analyzed to determine historical back ground conditions of Horse Creek, determine if any trends are evident and be the basis for comparing with current data collected as part of the HCSP.

The Annual Reports provide all the data collected as part of the HCSP and compares these results with the historical data. The intent is to determine if current water quality is different from the past and if a trend can be determined. Below is Summary Table I showing the progress of the various reports required by the stewardship program.

#### Impact Assessments.

As required by the HCSP, if a water quality parameter exceeds a specified trigger value or a significant trend in the data is found, then Mosaic will initiate an impact assessment for the cause of the exceeded level. The assessment can consist of further monitoring, and evaluations within the basin and may result in scientific assistance from Mosaic (if not at fault) or corrective mining actions (if at fault). If the assessment finds Mosaic at fault for the exceeded trigger level or increasing trend then the impact assessment is followed by corrective actions evaluation and implementation. Below is Summary Table II showing the frequency of exceeded trigger levels for the stewardship program.

All previous impact assessments have shown that the trigger levels were exceeded due to other causes not related to mining activities. The most recent event was in May 2011 where station 1 was found to have high ammonia levels. The impact assessment for this event was completed and found that the high ammonia was due to lab error.

**Summary Table I  
Project Reports**

Report Title	Receive First Draft Report	Receive Final Draft Report	TAG Review	Receive Final Report
2003 Annual Report	10/08/04	2/7/05	3/24/05	7/14/05
Historical Report	8/16/05	12/5/05	2/23/06	4/28/06
2004 Annual Report	3/10/06	8/30/06	11/14/06	1/12/07
2005 Annual Report	3/9/07	6/20/07	7/27/07	9/18/07
2006 Annual Report	4/8/08	4/8/08	6/16/08	9/12/08
QA/QC Plan	2011			
2007 Annual Report	2/03/09	2/03/09	3/12/09	11/23/09
2008 Annual Report	6/4/10	N/A	8/4/10	9/29/10
2009 Annual Report	1/13/11	N/A	3/1/11	10/22/11
2010 Annual Report	12/15/11		2/29/12	Oct 2012
2011 Annual Report	Nov 2012			

**Summary Table II  
Exceeded Trigger Levels**

<b>Project Period</b>	<b>Station Number</b>	<b>Chemical Parameter</b>	<b>Frequency of Exceeded Trigger Levels (months)</b>
Apr 2003 – May 2012 ( 110 months)	1	Dissolved Oxygen	3/110
	1	Color	1/110
	1	pH	2/110
	1	Alkalinity	5/110
	1	Fatty Acid	1/110
	1	Chlorophyll	1/110
	2	Dissolved Oxygen	89/110
	2	pH	2/110
	2	Chlorophyll	19/110
	2	Total Nitrogen	1/110
	2	Radium 226 + 228	1/110
	2	Iron	2/110
	2	Total Ammonia	1/110
	2	Fatty Acid	9/110
	3	Dissolved Oxygen	35/110
	3	Total Nitrogen	2/110
	3	Color	2/110
	3	Total Dissolved Solids	16/110
	3	Dissolved Calcium	6/110
	3	Chlorophyll	1/110
	3	Fatty Acid	1/110
	3	pH	1/110
	3	Total Ammonia	2/110
	3	Sulfate	12/110
	4	pH	1/110
	4	Iron	38/110
	4	Dissolved Oxygen	15/110
	4	Sulfate	17/110
	4	Total Dissolved Solids	23/110
	4	Conductivity	1/110
	4	Dissolved Calcium	10/110
	4	Total Alkalinity	4/110
	4	Total Ammonia	1/110
	4	Fluoride	5/110
	4	Fatty Acid	1/110

## **Project Status Report**

**Project:** Horse Creek Stewardship Program

**Date:** October 3, 2012

**Prepared by:** Samuel Stone, Land and Environmental Services Manager

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The following information is a brief summary of recent activities occurring with the Horse Creek Stewardship Program (HCSP).

### Technical Advisory Group (TAG).

The TAG met February 29, 2012 to review and comment on the draft *Horse Creek Stewardship Program 2010 Annual Report*.

### Monthly Water Quality Monitoring.

This sampling effort by Mosaic has continued without any interruption of collected data. Mosaic has transmitted data to the Authority covering the period April 2003 – July 2012. Mosaic continues to voluntarily sample and report data from Brushy Creek.

### Macroinvertebrate and Fish Sampling.

These biological samples were collected during the Spring 2012 time frame on March 30. Due to low stream flow conditions the Spring samples were partially collected. The schedule for Summer wet season samples are tentatively scheduled for late September but will remain unknown until stream flow conditions can be determined. Fall samples are expected to be collected in either October or November but the actual date will be determined by creek flows and the summer collection date.

### Reports.

The draft *Horse Creek Stewardship Program 2010 Annual Report* has been reviewed by the Authority staff, Authority consultants Earth Balance and the TAG. Currently Cardno / Entrix and Mosaic are revising the draft report with the expectation that revisions would be complete in November 2012. After a final review, the report is expected to be complete in December 2012.

### Recent Impact Assessments.

May 2011 data showed that the trigger level for ammonia was exceeded at station 4 and an impact assessment was requested. Mosaic and their consultant Cardno / Entrix evaluated the data, split samples between Mosaic and the WMD all to help in evaluating the cause for exceeding the trigger level. The findings were that the Mosaic lab had made errors in the measurement of ammonia.

## **Project Historical Briefing**

**Project:** Horse Creek Stewardship Program

**Date:** October 3, 2012

**Prepared by:** Samuel Stone, Land and Environmental Services Manager

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The Settlement Agreement between the Peace River Manasota Regional Water Supply Authority (Authority) and Mosaic Fertilizer Company (Mosaic) became effective on March 5, 2003. Contained within the agreement is the required implementation of the Horse Creek Stewardship Program (HCSP) by Mosaic and included program oversight by the Authority.

The HCSP consists of multiple tasks occurring on different schedules. Below is a list of the major tasks, a brief description of the tasks and historical progress on those tasks.

### Technical Advisory Group (TAG).

The TAG as required by the HCSP consists of one representative from each member government. The TAG is to review the progress and findings of the program and provide technical input to the Authority. Members of the TAG consist of the following people. William Byle (Charlotte County), DeSoto County currently has no representative, Robert Brown (Manatee County) and John Ryan (Sarasota County). The TAG last met on February 29, 2012 to review the draft *Horse Creek Stewardship Program 2010 Annual Report*.

### Monthly Water Quality Monitoring.

Mosaic collects surface water samples from Horse Creek at four fixed stations once per month. These samples are analyzed for various chemical parameters and the results reported to the Authority monthly. Mosaic volunteered to begin collecting samples on Brushy Creek in September 2009.

This sampling effort by Mosaic was started in April 2003 and has continued monthly without any interruption of collected data. EarthBalance visits the monitoring sites to collect samples at random to spot check water quality

### Macroinvertebrate and Fish Sampling.

This biological sampling effort is required three times per year in Spring (March - April), Summer (July - September) and Fall (October - December). The biological sample locations are the same four fixed stations used for water quality monitoring.

### Clay Settling Ponds Real Time Monitoring.

This component requires that the Authority have the ability to monitor in real time the fluid levels of various clay settling ponds. This system could act as an early warning device for the Peace River Facility staff should an embankment fail, releasing clay material into Horse Creek. In the

summer of 2010 Mosaic volunteered to add a newly constructed clay settling pond located in the Horse Creek watershed to the monitoring system for a total of three ponds. The Authority has completed the Facility SCADA system modifications to accept this new third clay pond data. Final calibrations and set up of the system is complete.

#### Horse Creek Flow Data.

Flow and stage data is collected and monitored at the four fixed water quality sample stations. Stations 1 & 4 have existing USGS stations with data available on the USGS web site. Stations 2 & 3 required the installation of stage level gages and monitoring / reporting by Mosaic.

#### Water Quality Continuous Recorder.

The continuous water quality monitoring equipment became operational in July 2003 and is located at the fixed water quality station number 1, closest to mining operations. Monthly this data is down loaded in the field, and placed into a data base. This monitoring effort is on going. This data is supplied as part of the Annual Report and summarized monthly along with other routine water quality data

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2011 Annual Report	Feb 2013			



**Summary Table II  
Exceeded Trigger Levels**

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Apr 2003 – July 2012 ( 112 months)	1	Dissolved Oxygen	3/112
	1	Color	1/112
	1	pH	2/112
	1	Alkalinity	5/112
	1	Fatty Acid	1/112
	1	Chlorophyll	1/112
	2	Dissolved Oxygen	89/112
	2	pH	2/112
	2	Chlorophyll	19/112
	2	Total Nitrogen	1/112
	2	Radium 226 + 228	1/112
	2	Iron	2/112
	2	Total Ammonia	1/112
	2	Fatty Acid	9/112
	3	Dissolved Oxygen	37/112
	3	Total Nitrogen	2/112
	3	Color	2/112
	3	Total Dissolved Solids	17/112
	3	Dissolved Calcium	6/112
	3	Chlorophyll	1/112
	3	Fatty Acid	1/112
	3	pH	1/112
	3	Total Ammonia	2/112
	3	Sulfate	13/112
	4	pH	1/112
	4	Iron	39/112
	4	Dissolved Oxygen	16/112
	4	Sulfate	18/112
	4	Total Dissolved Solids	24/112
	4	Conductivity	2/112
	4	Dissolved Calcium	11/112
	4	Total Alkalinity	4/112
	4	Total Ammonia	1/112
	4	Fluoride	5/112
	4	Fatty Acid	1/112