

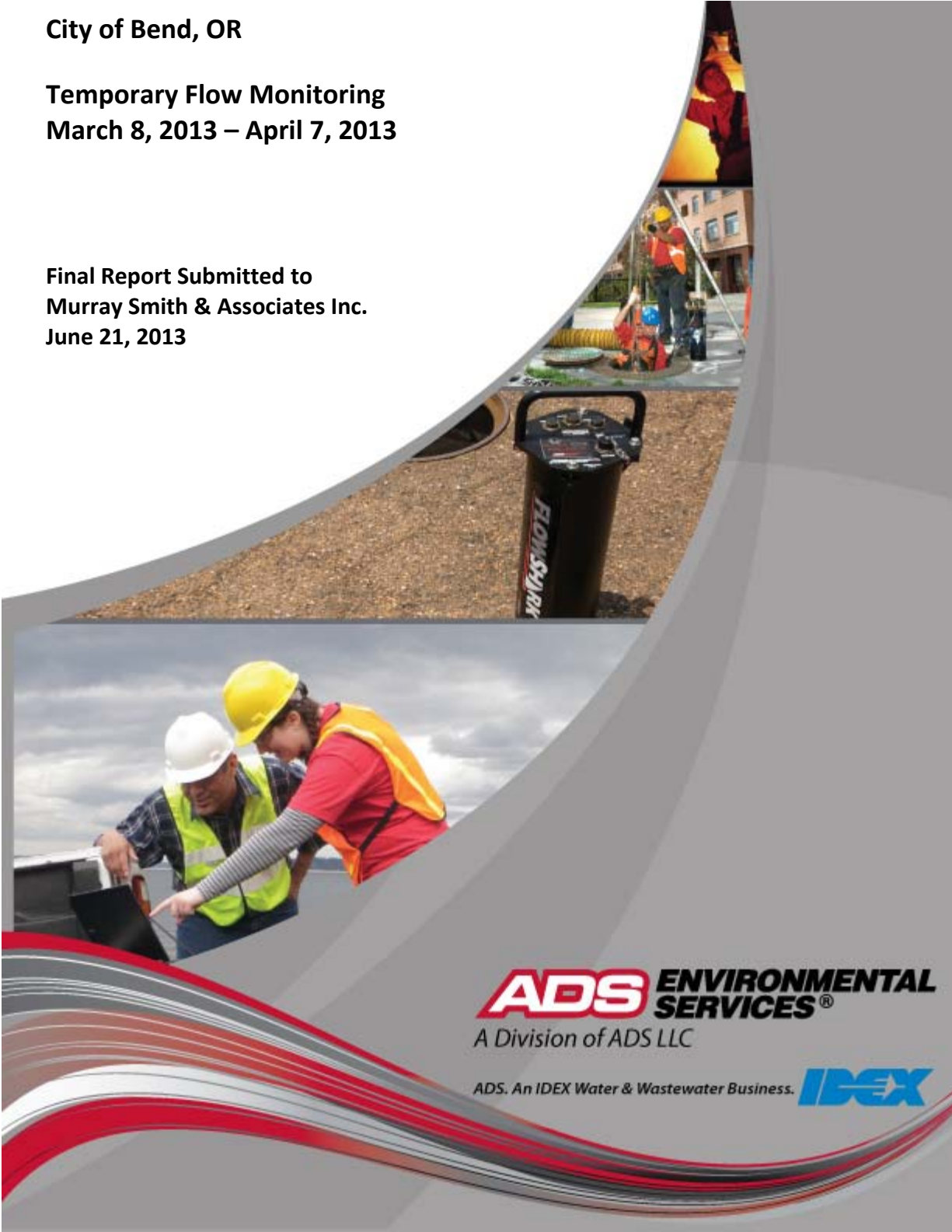




**City of Bend, OR**

**Temporary Flow Monitoring  
March 8, 2013 – April 7, 2013**

**Final Report Submitted to  
Murray Smith & Associates Inc.  
June 21, 2013**



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June 21, 2013

Mark A. Cummings, P.E.  
Murray, Smith & Associates, Inc. (MSA)  
1649 West Shoreline Drive, Suite 200  
Boise, Idaho, 83702-6701  
P: 208.947.9033  
[Mark.Cummings@msa-ep.com](mailto:Mark.Cummings@msa-ep.com)

**Re: Results and Analysis of Flow Monitoring Data – Final Report**

Dear Mr. Cummings,

Thank you for the opportunity to complete this flow monitoring work effort for MSA and the City of Bend, OR. Please find attached the electronic report of results and conclusions based on the flow monitoring study conducted March 8, 2013 – April 7, 2013.

Per MSA and the City's request the site summaries contain an evaluation regarding the expected accuracy of the flow monitoring site. ADS expects to get within +/- 5% of the flow rate when referring to installed accuracy. Naturally, there are many variables involved when installing flow monitoring equipment (for example, waves at the site or spiraling velocity). If the equipment is installed incorrectly (for example, an ultrasonic sensor is not level) this can also lead to measurement error. These types of situation, if unidentified or acknowledged, can result in significant flow measurement error (far more error than the stated equipment accuracy).

ADS has a 34 step procedure for installing the equipment, and the ADS field team assigned to the Bend, OR project was very experienced and did an excellent job of installing the equipment. For this reason, our expectation for all the equipment installed in Bend, OR is that the data would be within +/-5%. However at some locations where the hydraulics are in the fair to poor range, the +/- is expected to be greater. The site commentary reflects our judgment of that error based on field notes and data interpretation (primarily scattergraph analysis).

Mark, we certainly look forward to other opportunities to work with MSA and the City on wastewater projects as they arise. If you have any questions regarding the content of this report, please do not hesitate to call me at (206) 255 6904.

Sincerely,

Gillian Woodward P.E. (WA)  
Senior Project Engineer Pacific Northwest  
[gwoodward@idexcorp.com](mailto:gwoodward@idexcorp.com)



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## Site Commentary

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### Site Information

Bend_000101	
Measured Pipe Height (in)	7.88
Nominal Pipe Height (in)	8
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_000101 was located in the Southeast of Bend (see attached site report for details).

The hydrograph indicates a commercial diurnal flow pattern with occasional discharge spikes during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.78	0.75	0.032
Minimum	0.81	0.19	0.004
Maximum	4.94	2.09	0.287
Time of Minimum	3/10/2013 5:20 AM	3/14/2013 4:10 AM	3/10/2013 3:40 AM
Time of Maximum	3/14/2013 4:35 AM	3/10/2013 1:00 PM	3/12/2013 1:00 PM

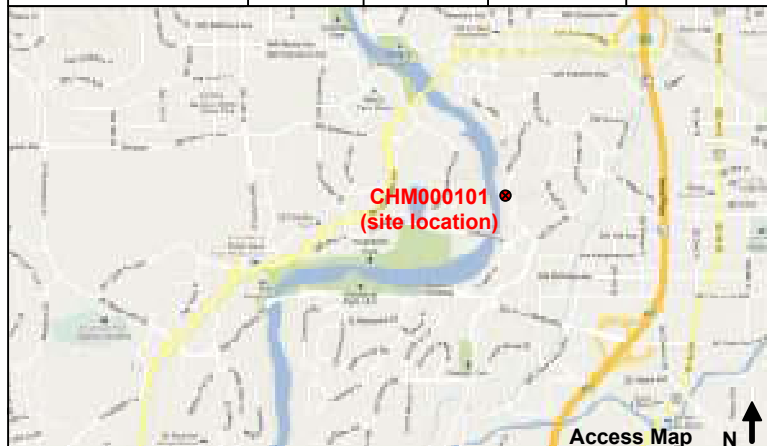
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_000101		Monitor Series: 5000 AG		Monitor S/N: 21724	
Address/Location: 545 SW Powerhouse Dr in-between Gap Kids and Anthony's Homeport		Manhole #		CMH000101	
		Coordinates:		44°02'42.55"N 121°18'56.30"W	
		Pipe Height:		7.88"	
Access: Drive		Type of System:		Pipe Width: 8.00"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.172.6	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	3/07/13 @ 09:02	Manhole Depth:	~ 12'
Site Hydraulics:	Smooth flow	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	Bend in line	Mini System Character:	Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Side inlet	Telephone Information:	Doesn't apply
Depth of Flow:	2.25" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	5.63" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.17 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:	
5 PSI pressure used at this location	



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_000101 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input checked="" type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only.  
Site located on sidewalk.

**\* Site Classification**

Class	Description
<input checked="" type="checkbox"/> 1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/> 2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/> 3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/> 4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/> 5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

<input checked="" type="checkbox"/>	This worksite does NOT require a traffic control Plan
<input type="checkbox"/>	Standard Traffic Control Plan is to be used at this work site
<input type="checkbox"/>	This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich  
 Signature: Signed can be obtained from ADS  
 Date: 3/07/13

#### Reviewed

Project Mgr Name: Mike Pina  
 Signature: Signed can be obtained from ADS  
 Date: 3/07/13



Bend\_000101

Site location

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Site access

SW Powerhouse Dr

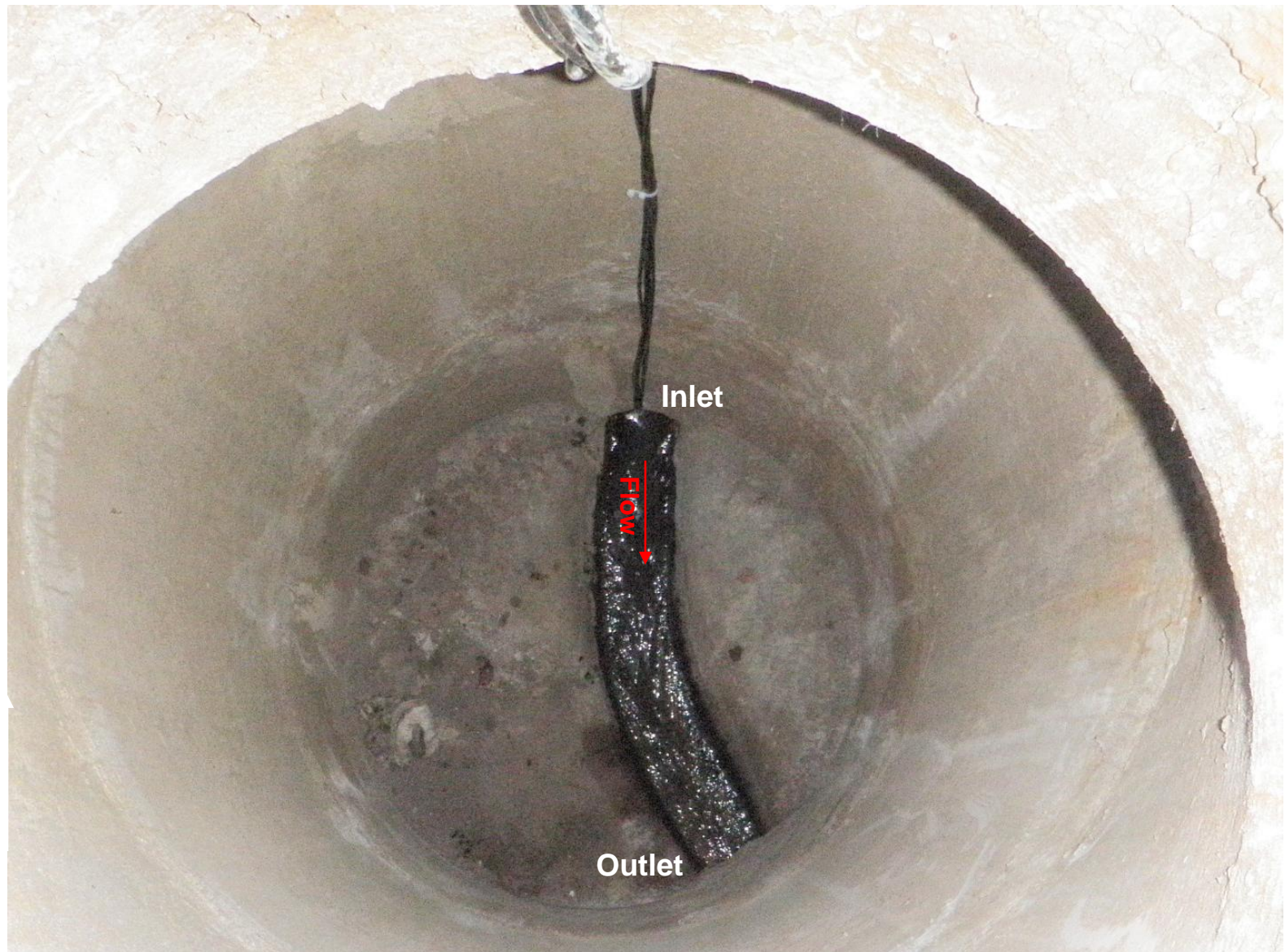
Site access looking northwest



Bend\_000101

Site set up

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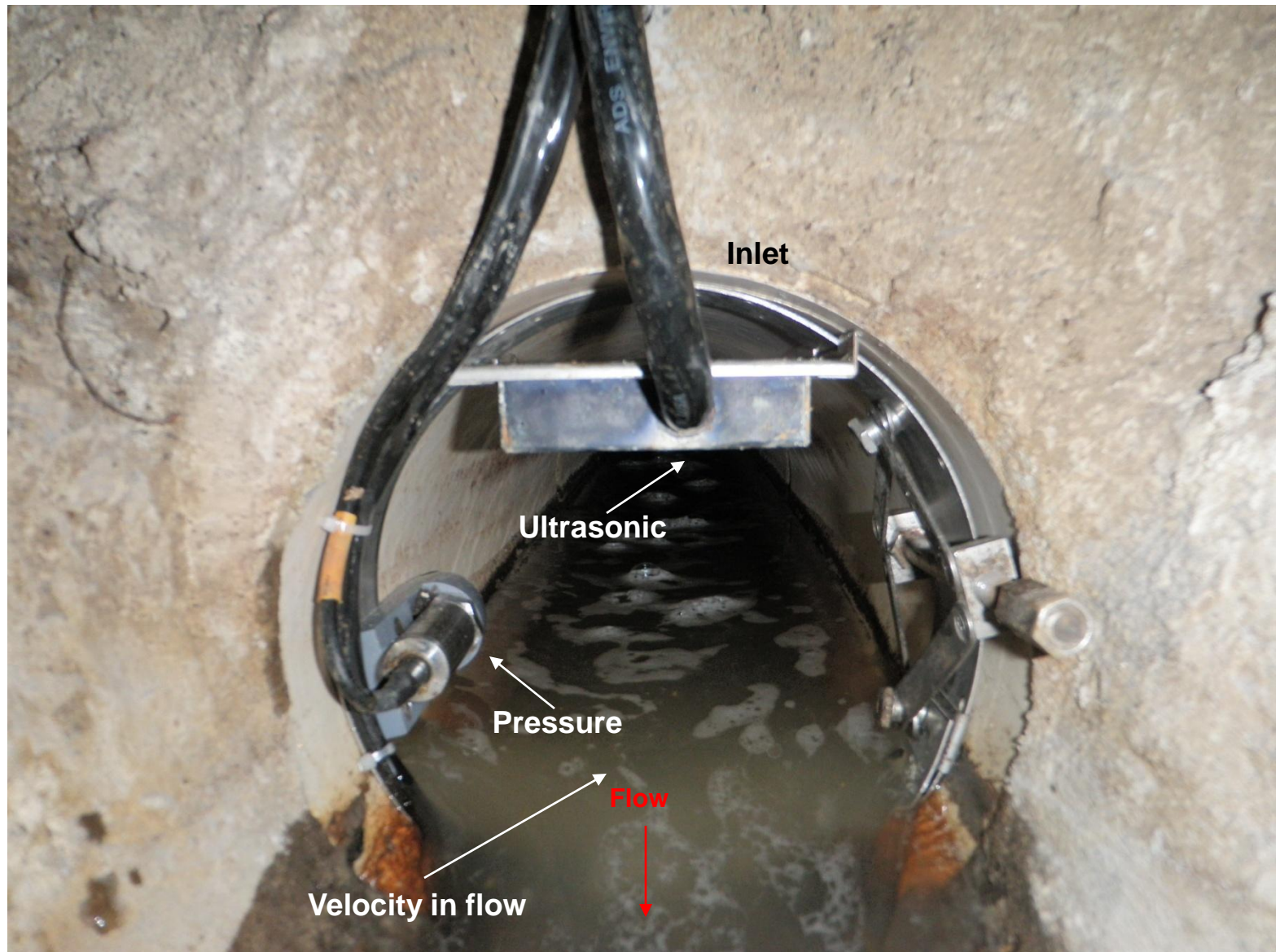
View down manhole facing north



Bend\_000101

Site set up

**ADS ENVIRONMENTAL  
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View of sensor placement and site hydraulics



Bend\_000101

Site outlet

**ADS** ENVIRONMENTAL  
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View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_000101

## Flow Monitor

Bend\_000101

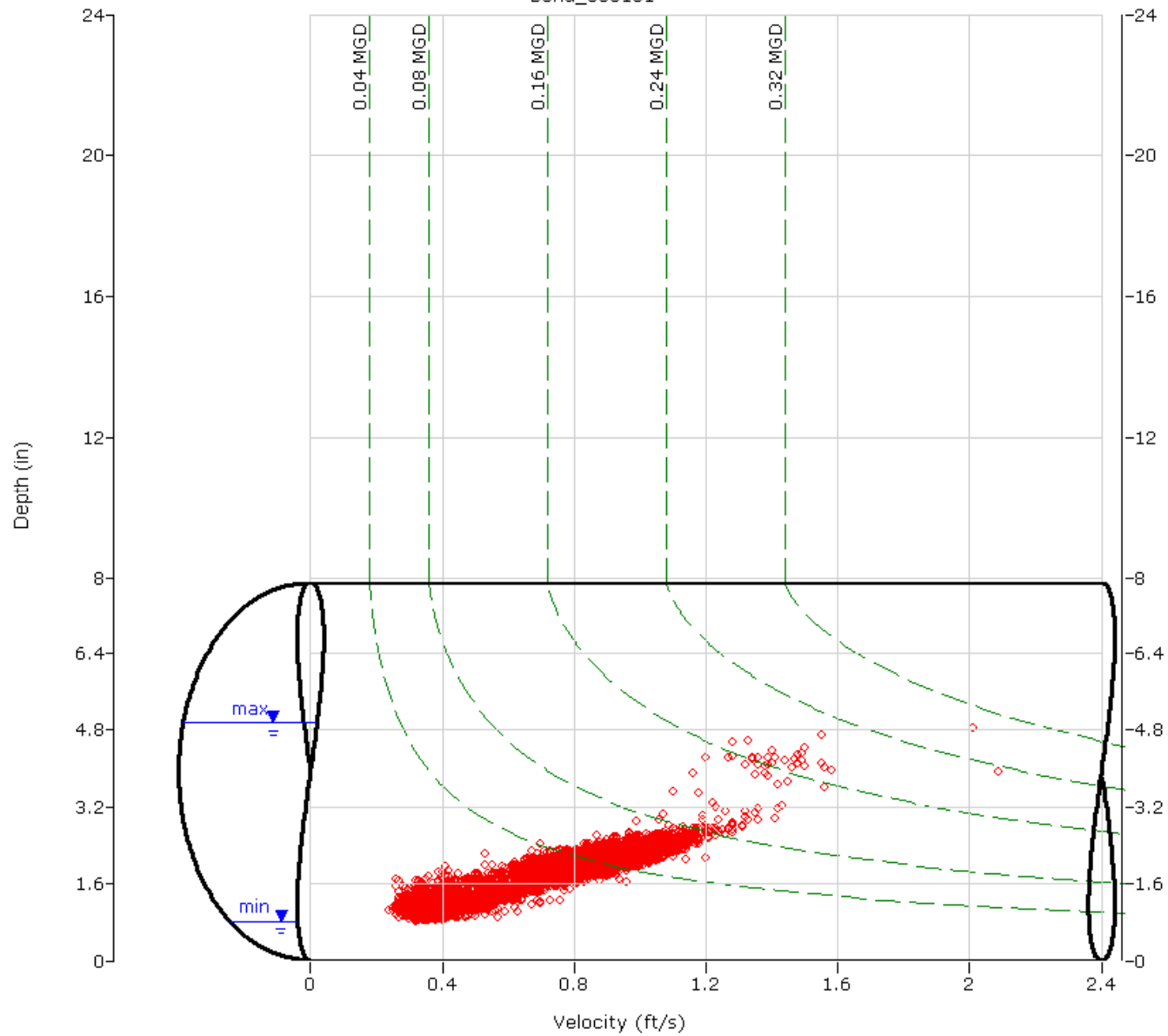
Pipe Height  
7.88 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_000101

## Flow Monitor

Bend\_000101

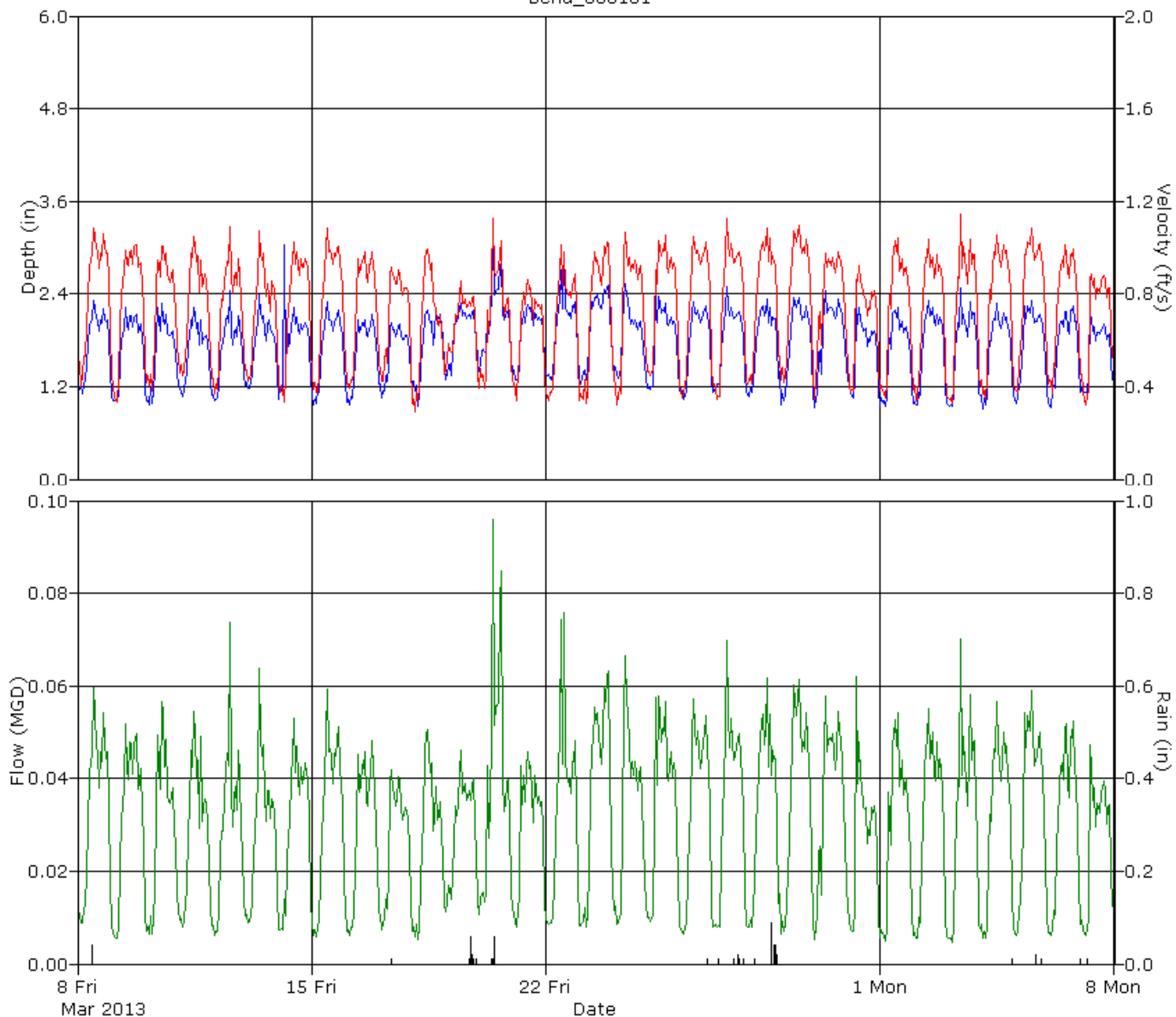
Pipe Height  
7.88 in.

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_000178	
Measured Pipe Height (in)	7.88
Nominal Pipe Height (in)	8
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_000178 was located in the Southeast of Bend (see attached site report for details).

The hydrograph indicates a commercial diurnal flow pattern with occasional discharge spikes during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	11.88	3.89	5.906
Minimum	5.92	2.37	1.325
Maximum	16.80	4.67	10.720
Time of Minimum	4/2/2013 5:30 AM	4/2/2013 5:35 AM	4/2/2013 5:30 AM
Time of Maximum	3/9/2013 12:15 PM	3/30/2013 12:10 PM	3/9/2013 12:15 PM

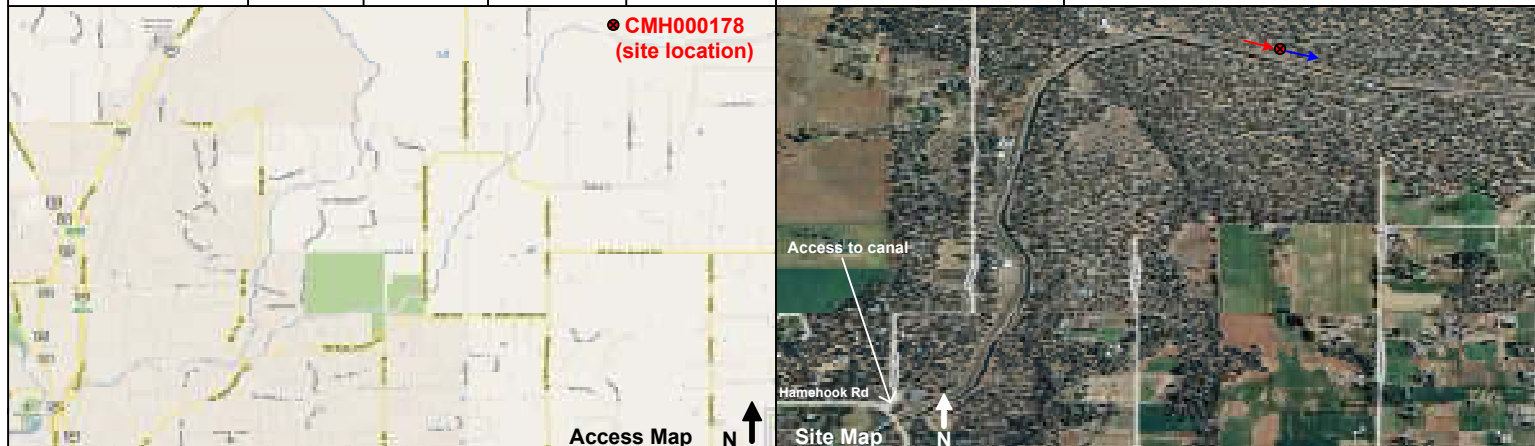
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_000178		Monitor Series: 5000 AG		Monitor S/N: 20072	
Address/Location: Along North Canal off of Hamelhook Rd.		Manhole #		CMH000178	
		Coordinates:		44° 7'9.93"N 121°14'8.13"W	
		Pipe Height:		41.63	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 41.63"
					IP Address: 166.219.172.4



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/18/13 @ 13:04	Manhole Depth:	~ 8'
Site Hydraulics:	Fast with waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	16.50" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	25.13" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	4.91 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_JRRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_000178 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

<input checked="" type="checkbox"/>	This worksite does NOT require a traffic control Plan
<input type="checkbox"/>	Standard Traffic Control Plan is to be used at this work site
<input type="checkbox"/>	This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich  
 Signature: Signed copy can be obtained from ADS  
 Date: 2/18/13

#### Reviewed

Project Mgr Name: Mike Pina  
 Signature: Signed copy can be obtained from ADS  
 Date: 2/18/13



Bend\_000178

Site set up



Site location

Site access looking north

Photo taken  
2.19.13



Bend\_000178

Site set up



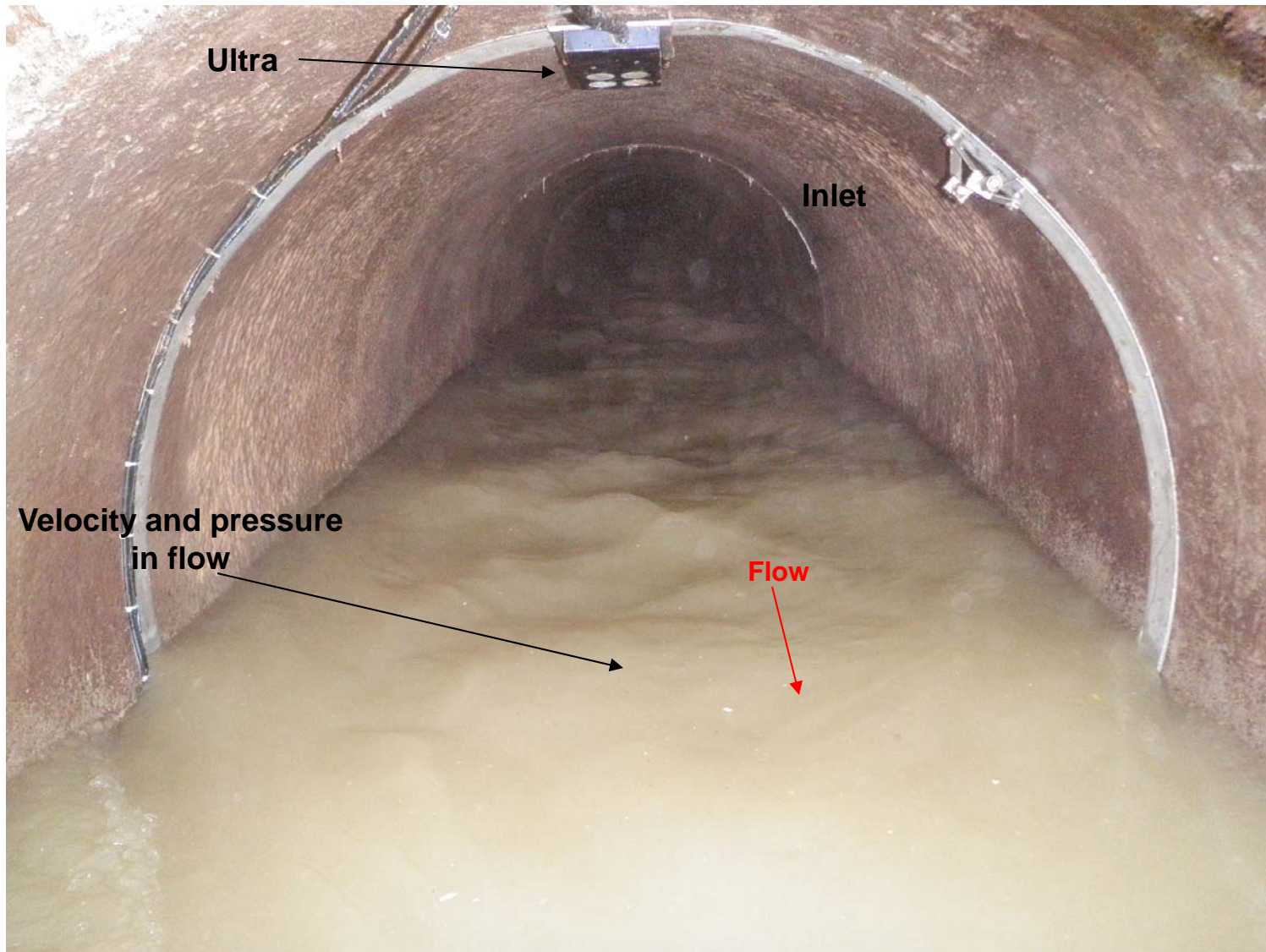
View down manhole facing north

Photo taken  
2.19.13



Bend\_000178

Site set up



View of sensor placement and site hydraulics

Photo taken  
2.19.13



Bend\_000178

Site set up



View of outlet and hydraulics

Photo taken  
3.29.11



# SCATTERGRAPH REPORT

Bend\_000178

## Flow Monitor

Bend\_000178

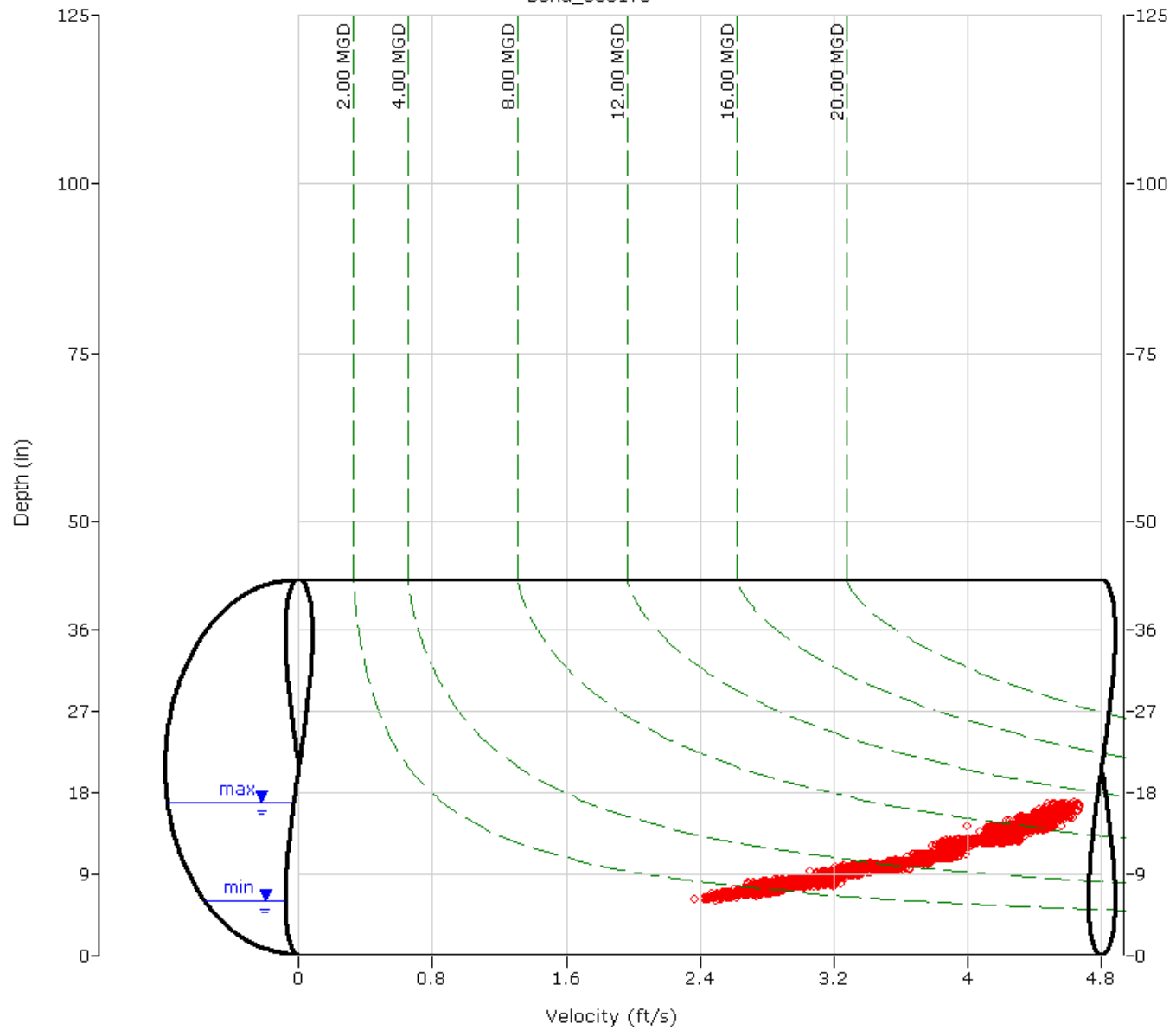
Pipe Height  
41.63 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_000178

## Flow Monitor

Bend\_000178

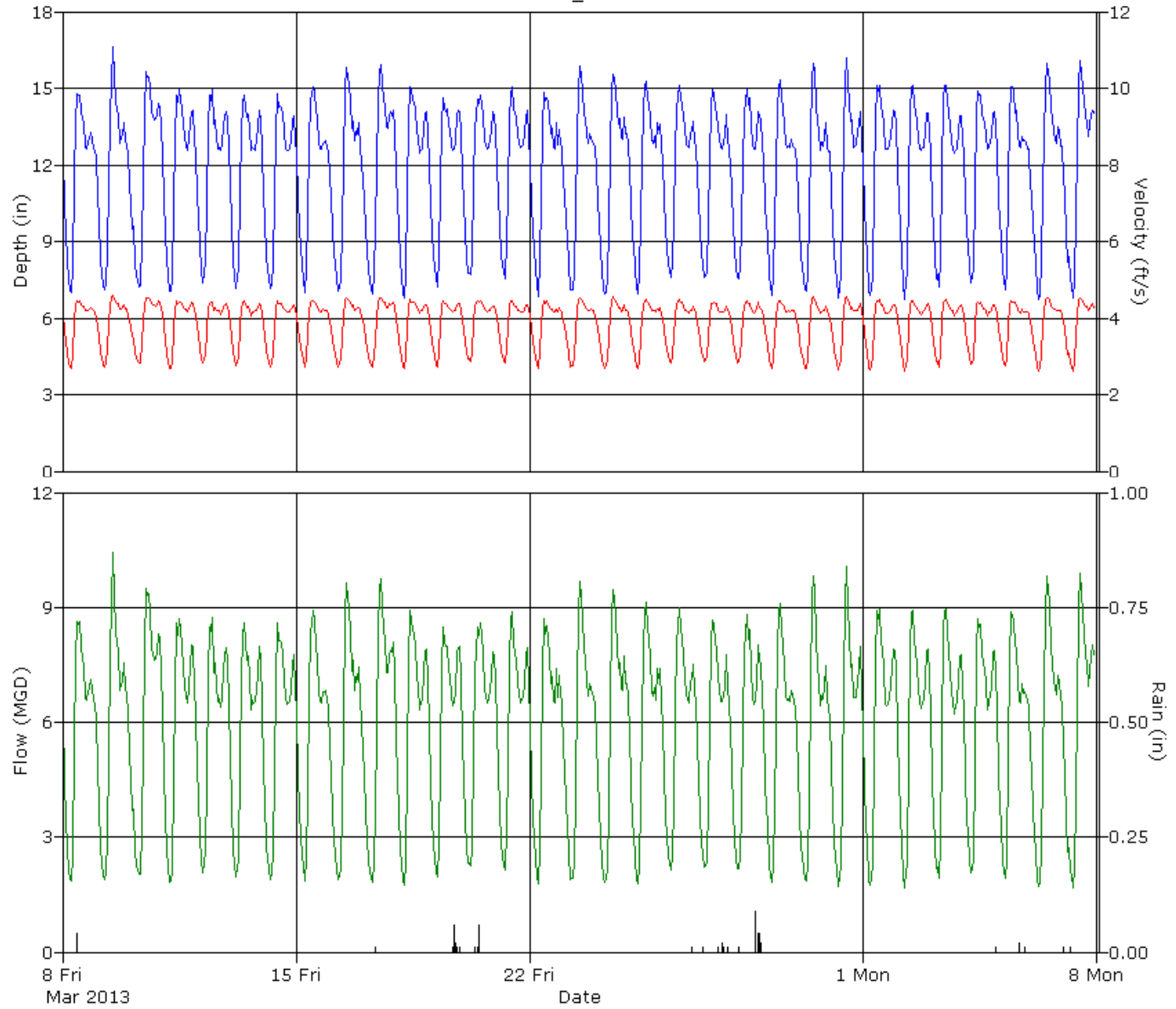
Pipe Height  
41.63 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_000237	
Measured Pipe Height (in)	7.88
Nominal Pipe Height (in)	8
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_000237 was located in the Southeast of Bend (see attached site report for details).

The hydrograph indicates a commercial diurnal flow pattern with occasional discharge spikes during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.42	0.60	0.061
Minimum	1.16	0.00	0.000
Maximum	7.74	1.75	0.362
Time of Minimum	3/15/2013 4:45 AM	3/31/2013 9:45 AM	3/31/2013 9:45 AM
Time of Maximum	3/31/2013 10:15 AM	4/1/2013 12:05 AM	4/4/2013 7:05 AM

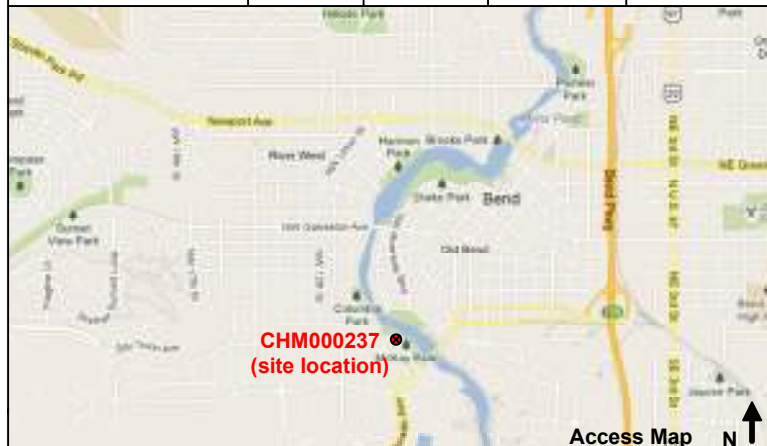
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	90
Quantity	90



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_000237		Monitor Series: 5000 AG		Monitor S/N: 21712	
Address/Location: 147 SW Shelvin-Hixon Dr.		Manhole #		CMH000237	
		Coordinates:		44°03'02.29"N 121°19'22.52"W	
		Pipe Height:		9.88"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 10.00"
					IP Address: 166.219.48.252



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	3/5/13 @ 12:13	Manhole Depth:	~ 8'
Site Hydraulics:	Smooth and slow flow	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	Small waves and slow flow	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Did not investigate	Telephone Information:	Doesn't apply
Depth of Flow:	2.50" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	5.75" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	0.45 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Cross Section</p>	<p>Planar</p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_000237 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 3/5/13

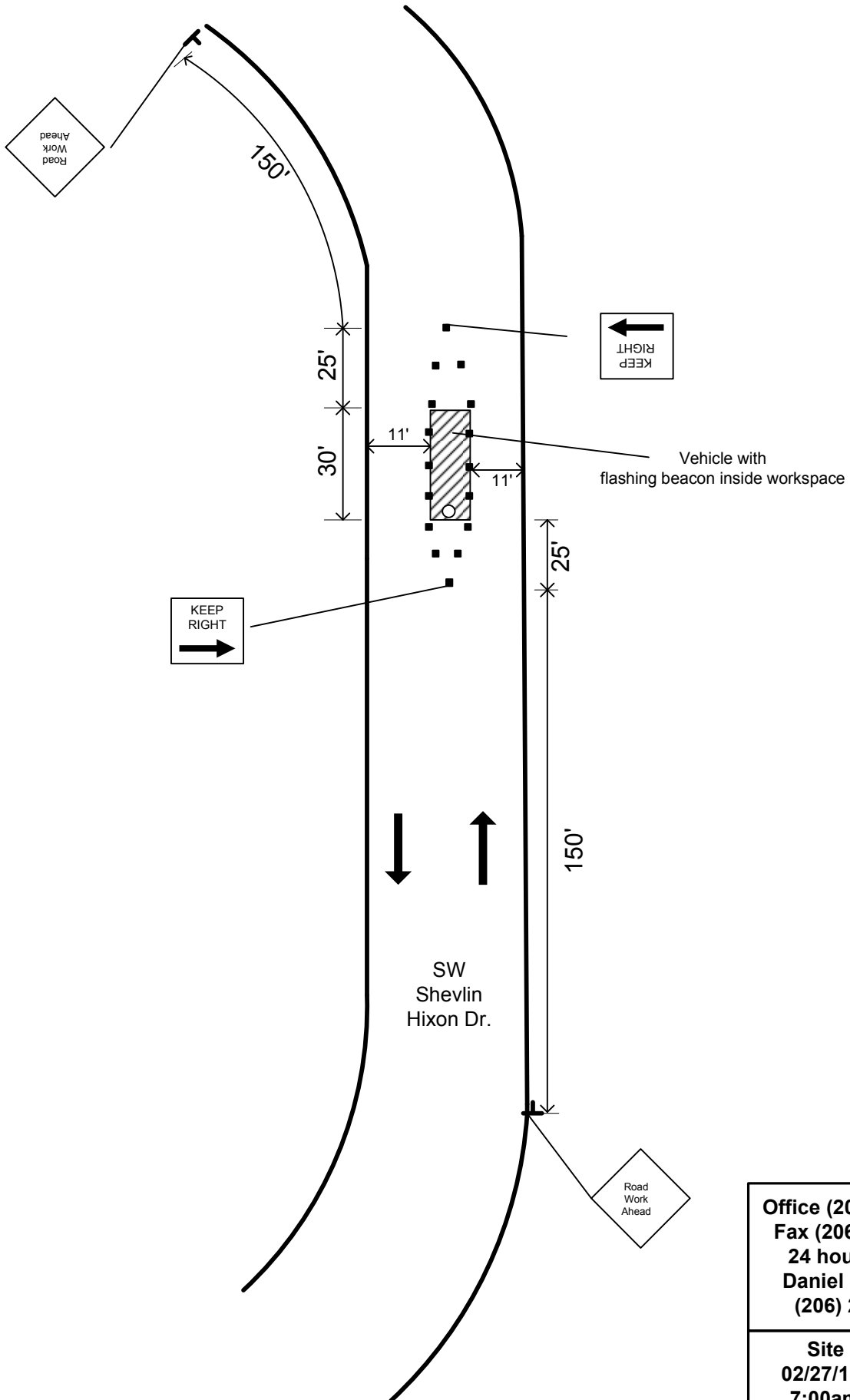
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 3/5/13





Posted Speed Limit

SPEED  
LIMIT  
**25**

Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

Site Access  
02/27/13-04/13/13  
7:00am-5:00pm



Bend\_000237

Site Access

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SW Shelvin-Hinson Dr

Site Location

Site access looking west



Bend\_000237

Site set up

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SERVICES®**



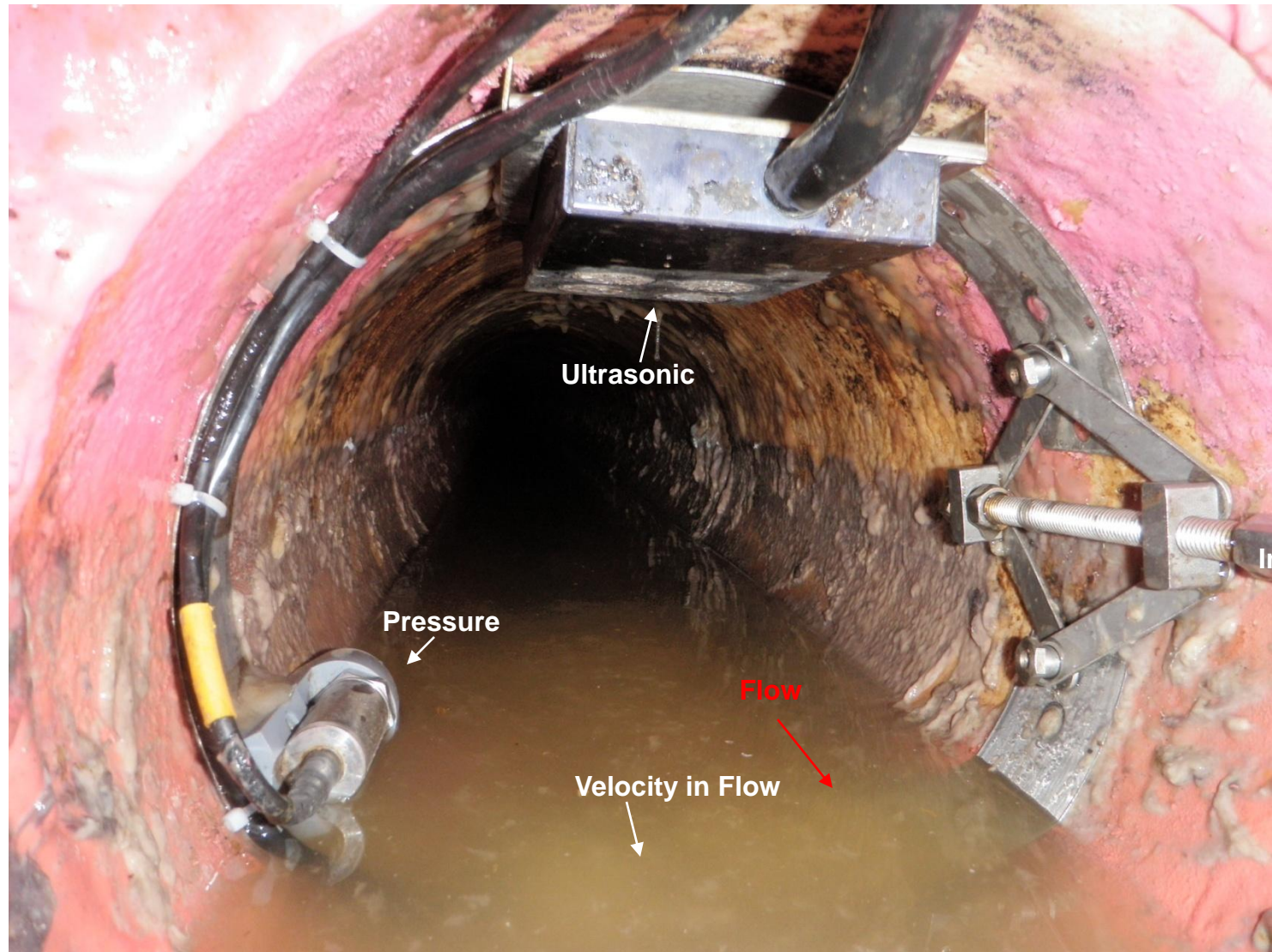
View of site looking west



Bend\_000237

Site set up

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SERVICES®**



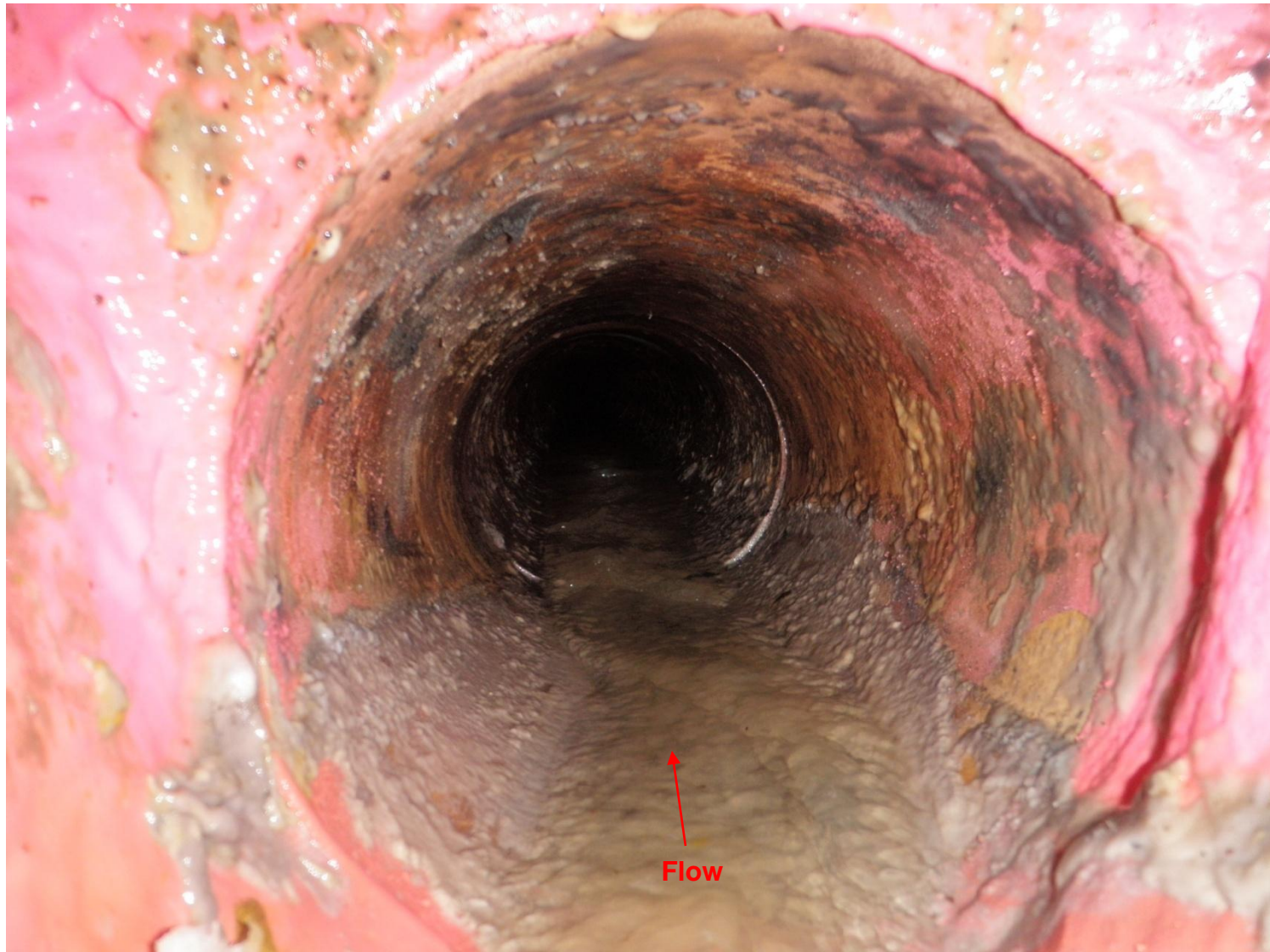
View of inlet and sensors



Bend\_000237

Site set up

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View of outlet



# SCATTERGRAPH REPORT

Bend\_000237

## Flow Monitor

Bend\_000237

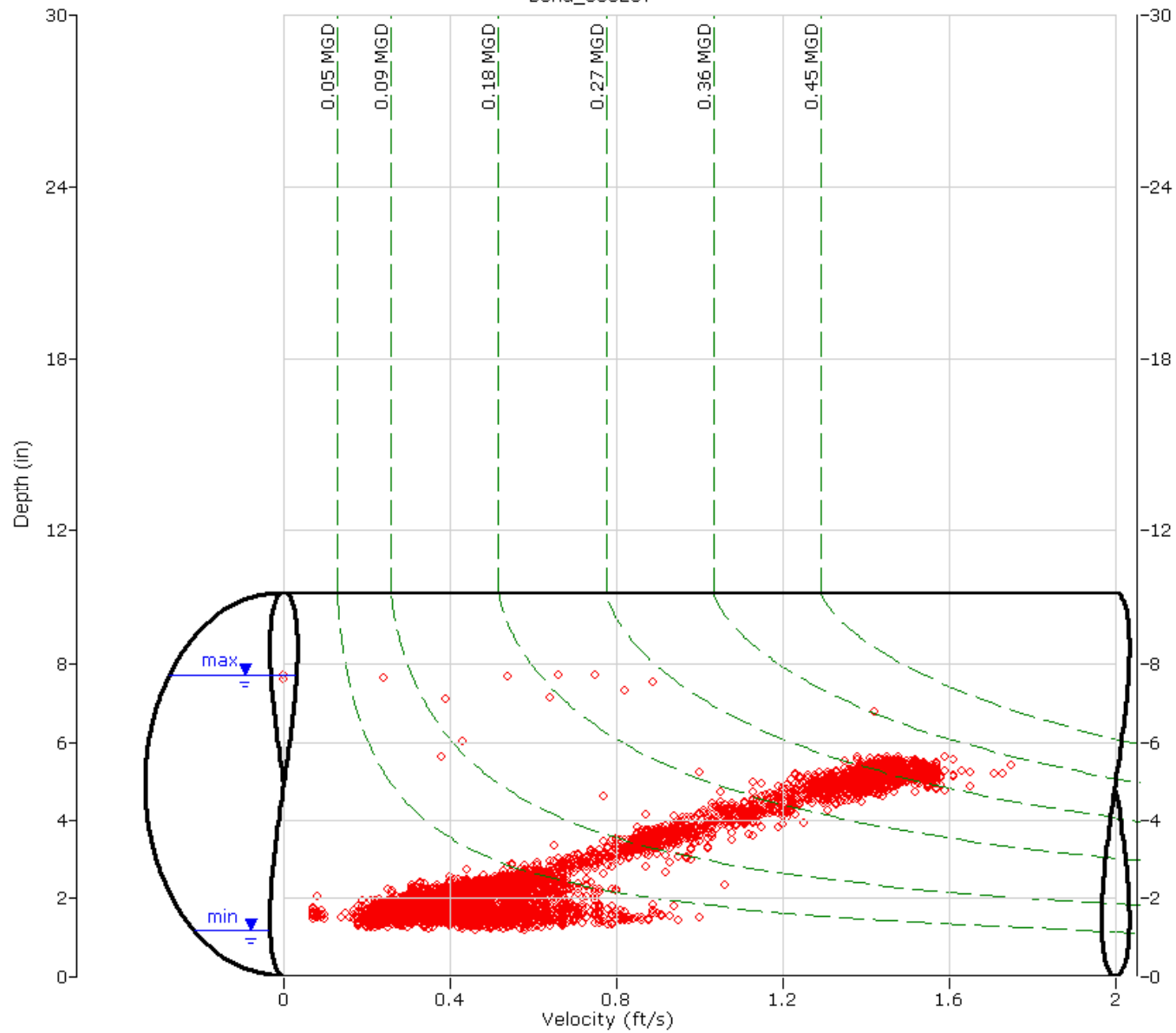
Pipe Height  
9.88 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_000237

## Flow Monitor

Bend\_000237

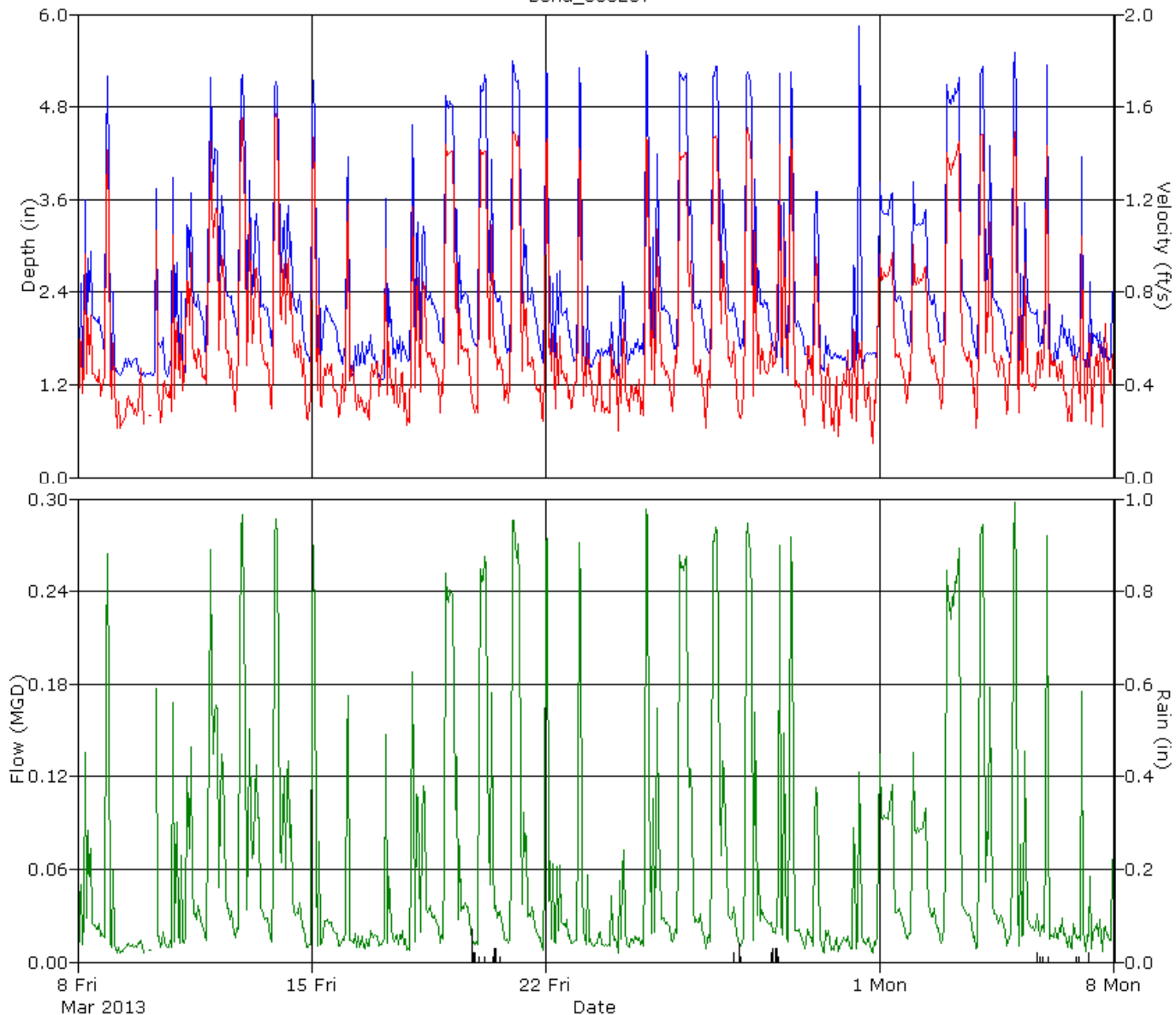
Pipe Height  
9.88 in.

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_000311	
Measured Pipe Height (in)	35.75
Nominal Pipe Height (in)	36
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_000311 was located in the Northeast of Bend (see attached site report for details).

The hydrograph indicates a residential/commercial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set, however a hydraulic jump appears at a depth of approximately 11.5" and therefore the data set should be used with caution. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 20% (or higher as a result of the hydraulic jump). The hydraulic jump was seen in the initial data review phase, however it was only after collecting more data that the actual severity of the jump was apparent.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	11.20	3.92	4.943
Minimum	5.32	2.38	1.059
Maximum	16.46	4.62	8.708
Time of Minimum	4/7/2013 5:20 AM	4/2/2013 4:45 AM	4/7/2013 5:20 AM
Time of Maximum	3/9/2013 11:25 AM	3/16/2013 11:25 AM	3/16/2013 11:40 AM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_000311		Monitor Series: 5000 AG		Monitor S/N: 21813	
Address/Location: South of NE Madison Ave. on NE Butler Market Rd.		Manhole #		CMH000311	
		Coordinates:		44°05'00.06" N, 121°16'32.85" W	
		Pipe Height:		35.75"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 35.75"
					IP Address: 166.219.172.43



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/22/2013 @ 12:40	Manhole Depth:	~ 8'
Site Hydraulics:	Waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No influences	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	12.75" +/- .38"	Access Pole #:	Doesn't apply
Range (Air DOF):	23.00" +/- .38"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	4.97 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Cross Section</p>	<p>Planar</p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultrasonic, Velocity, Pressure	Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height:	None observed	WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	Bend_JRRG	Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_000311 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input checked="" type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site is located in a 45 mph speed limit zone, requiring an approved traffic control plan. (Traffic Control Plan attached)  
 Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/22/13

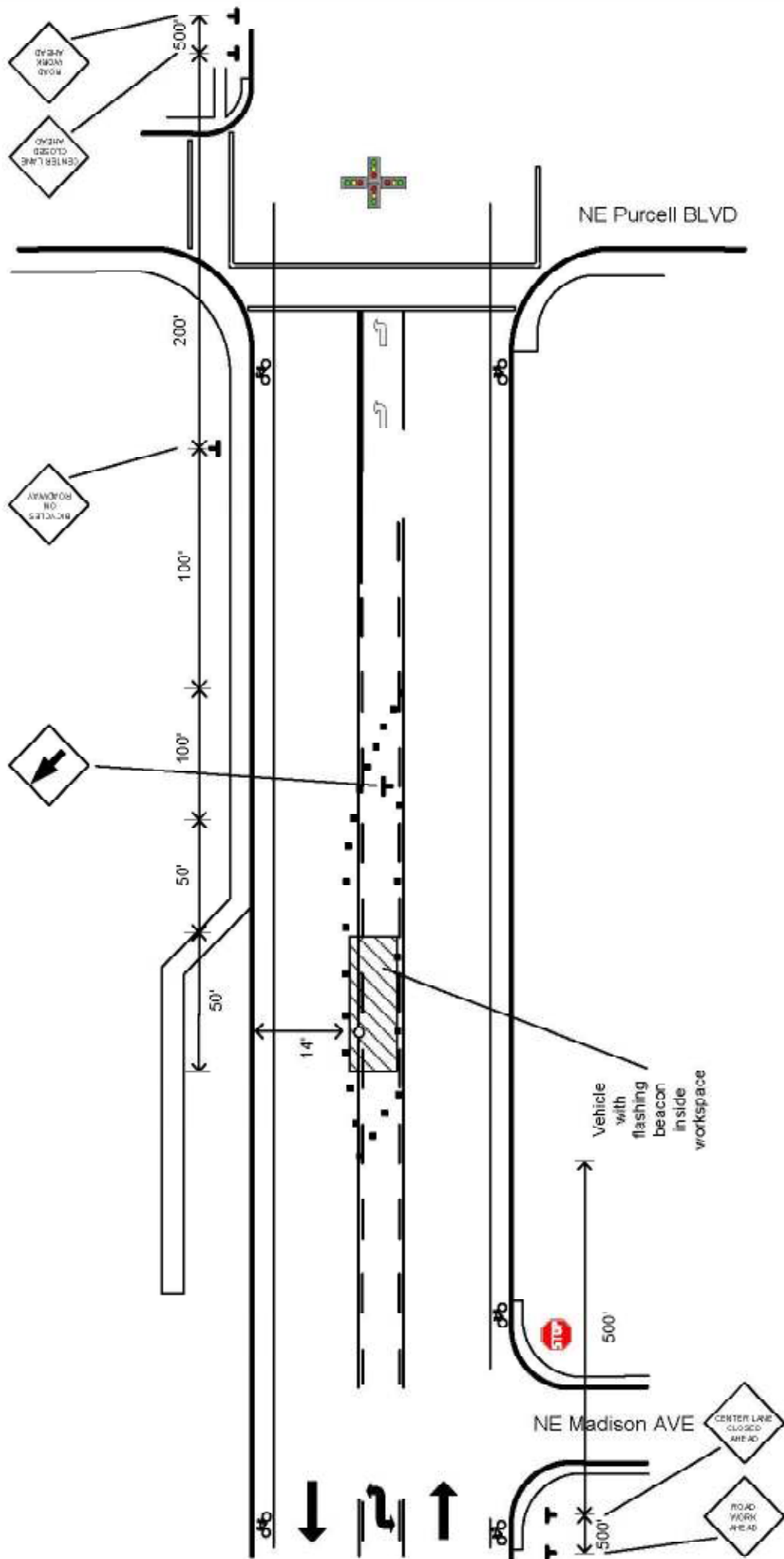
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/22/13





Posted Speed Limit

SPEED LIMIT 45

Site Access  
02/14/2013-04/13/2013  
10:00am-3:00pm

Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464



Bend\_000311

Site location

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Site access

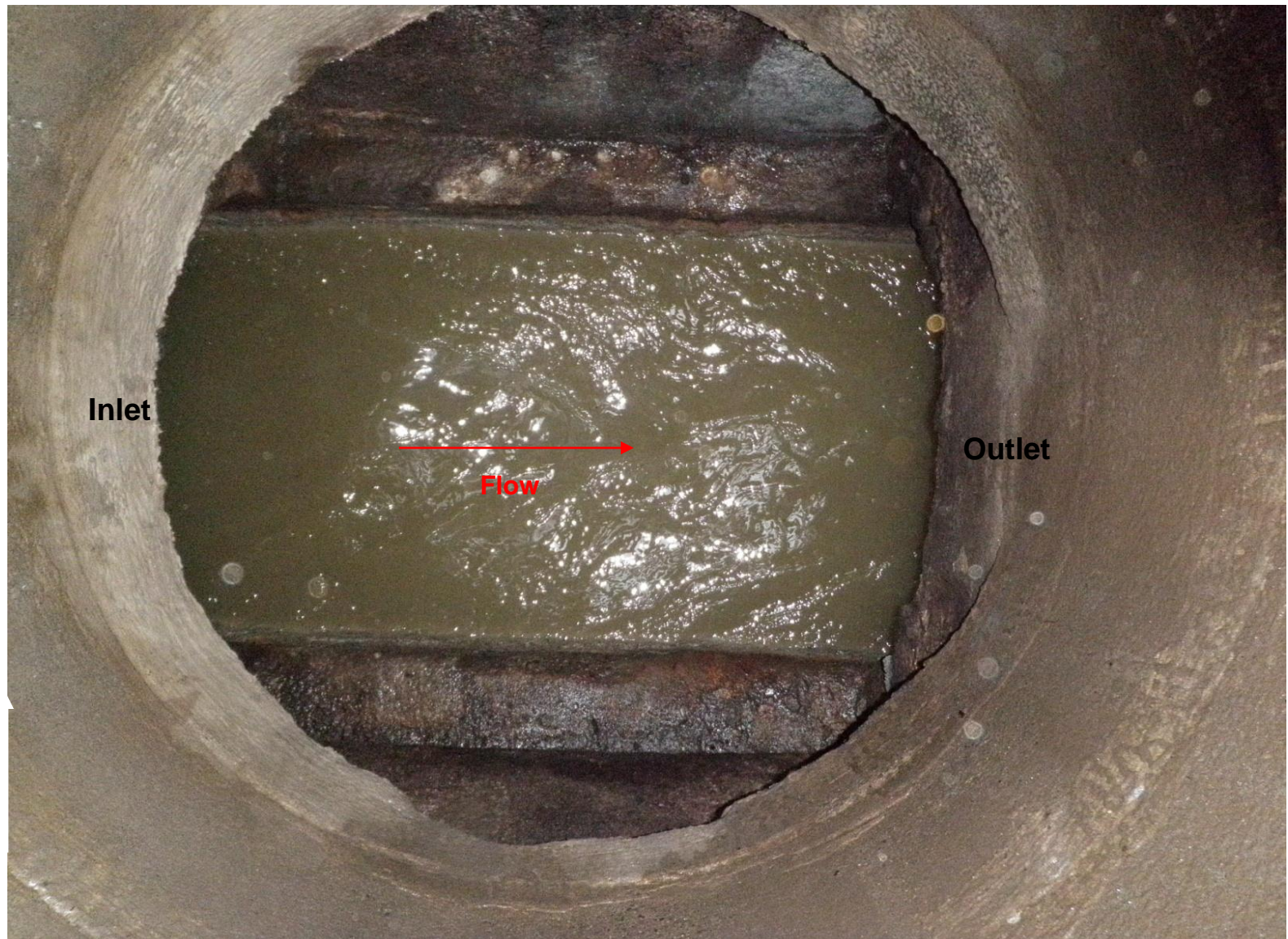
Site access looking north



Bend\_000311

Site set up

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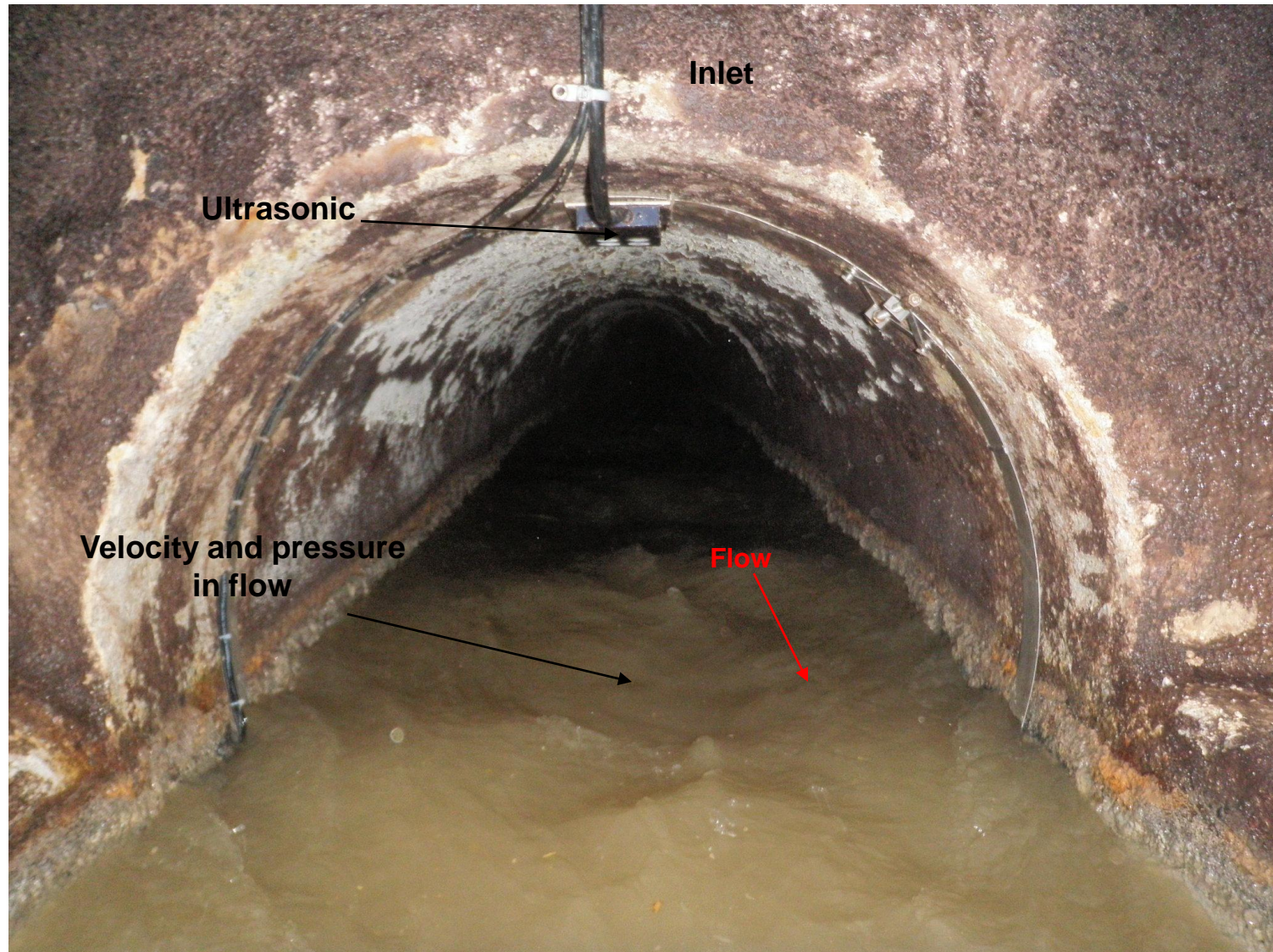
View down manhole facing north



Bend\_000311

Site set up

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View of sensor placement and site hydraulics



Bend\_000311

Site outlet

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View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_000311

## Flow Monitor

Bend\_000311

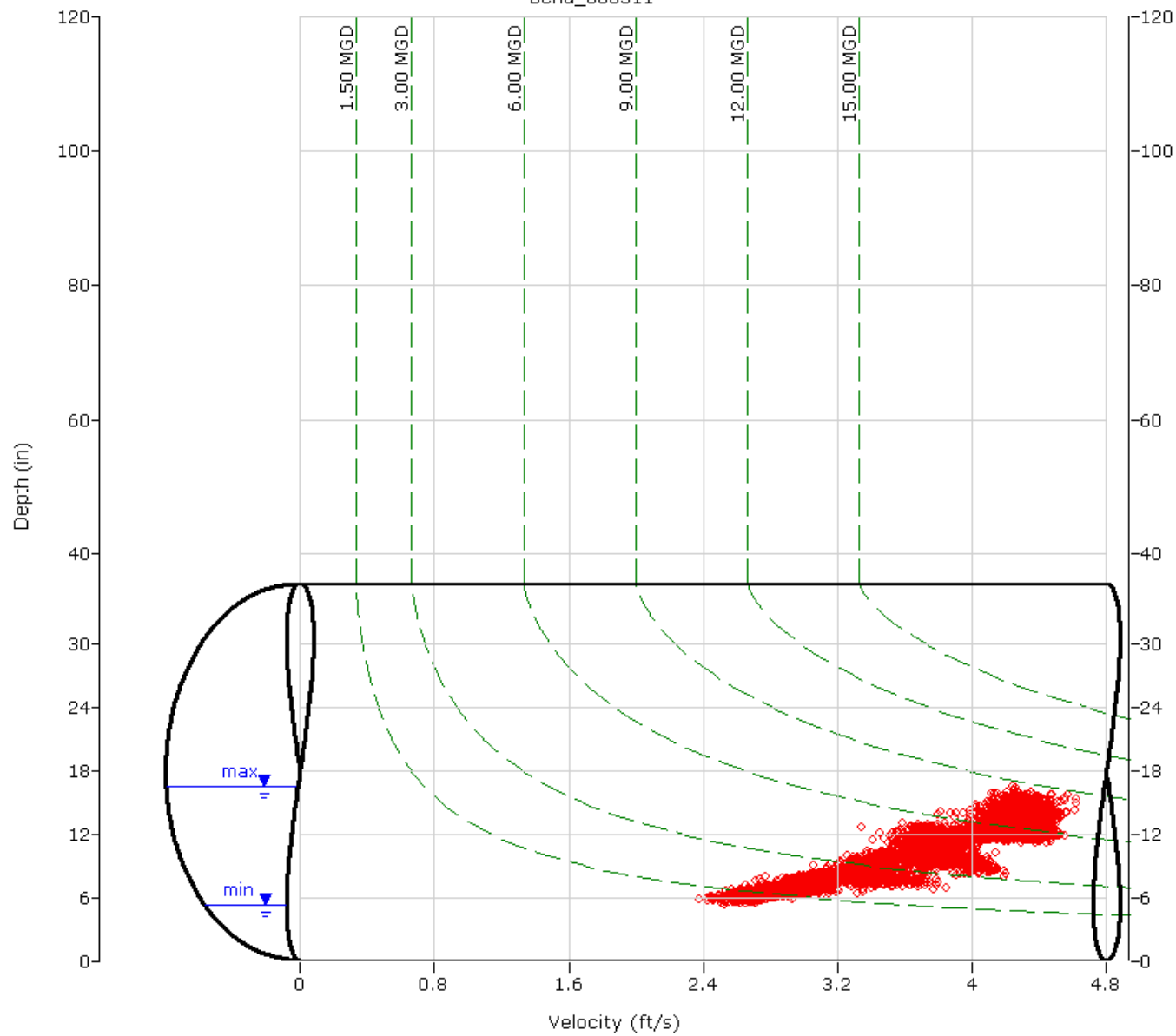
Pipe Height  
35.75 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_000311

## Flow Monitor

Bend\_000311

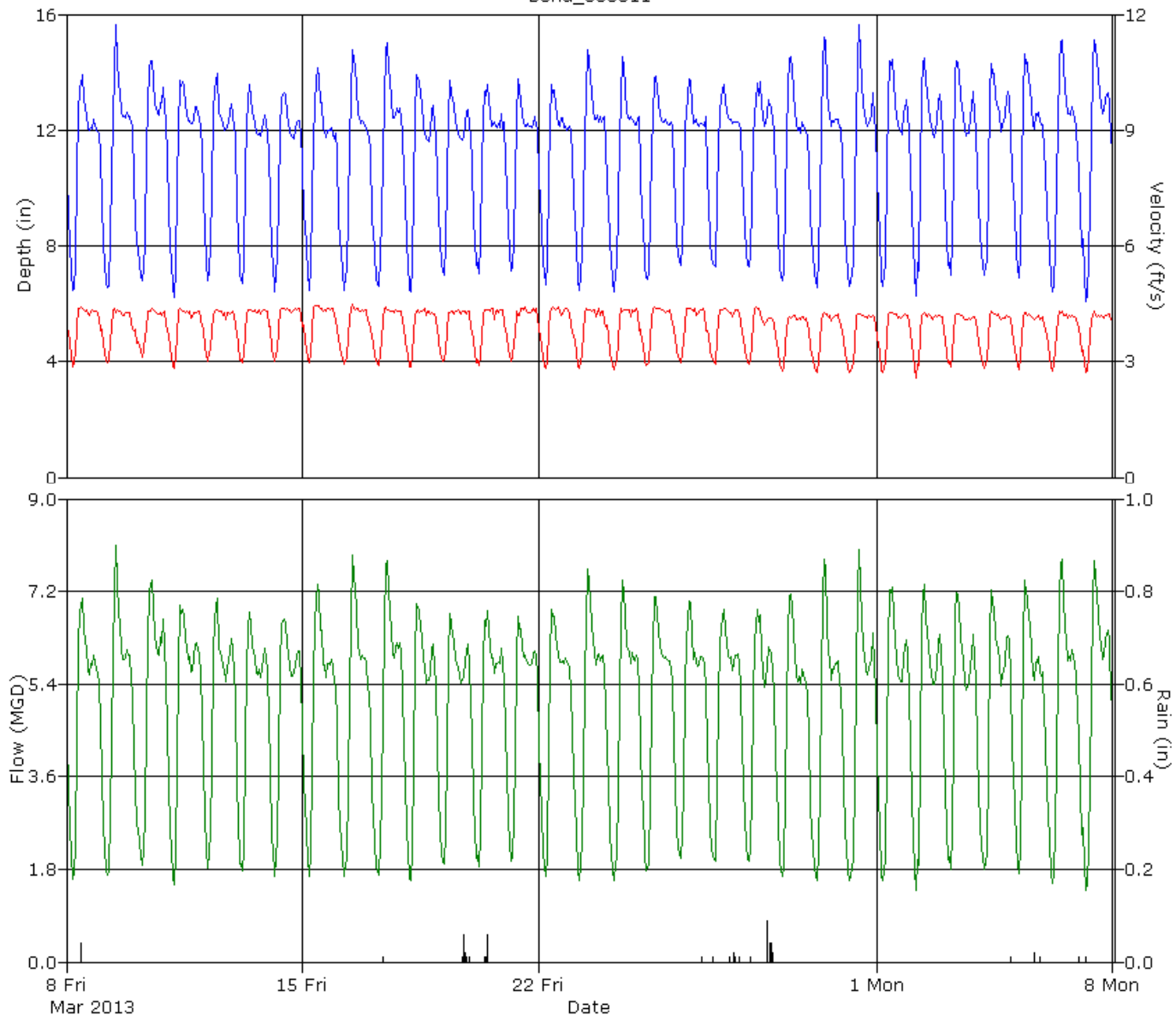
Pipe Height  
35.75 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

---

### Site Information

Bend_000317	
Measured Pipe Height (in)	27
Nominal Pipe Height (in)	27
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_000317 was located in the Northeast of Bend (see attached site report for details).

The hydrograph indicates a residential/commercial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set, with a slight hydraulic shift present. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	7.27	5.53	3.282
Minimum	3.22	1.96	0.392
Maximum	10.49	6.87	6.100
Time of Minimum	3/8/2013 5:30 AM	3/15/2013 5:10 AM	3/30/2013 7:00 AM
Time of Maximum	3/29/2013 11:40 AM	3/10/2013 11:30 AM	3/29/2013 11:40 AM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_000317		Monitor Series: 5000 AG		Monitor S/N: 20975	
Address/Location: 1630 NE Butler Market Rd		Manhole #		CMH000317	
		Coordinates:		44° 4'52.99"N 121°16'51.75"W	
		Pipe Height:		27.00"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 26.75"
					IP Address: 166.219.172.68



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/25/2013 @13:50	Manhole Depth:	~ 7'
Site Hydraulics:	Fast with waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	8.75" +/- 0.38"	Access Pole #:	Doesn't apply
Range (Air DOF):	18.25" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	7.50 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Pipe 27.00" X 26.75" diameter.</p> <p>M.H ~ 7 ft. deep</p> <p>N</p> <p>Cross Section</p>	<p>Ultrasonic, velocity, and pressure sensors location</p> <p>Flow</p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_JRRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_000317 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input checked="" type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site is located in a 45 mph speed limit zone, requiring an approved traffic control plan. (Traffic Control Plan attached)  
 Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/25/13

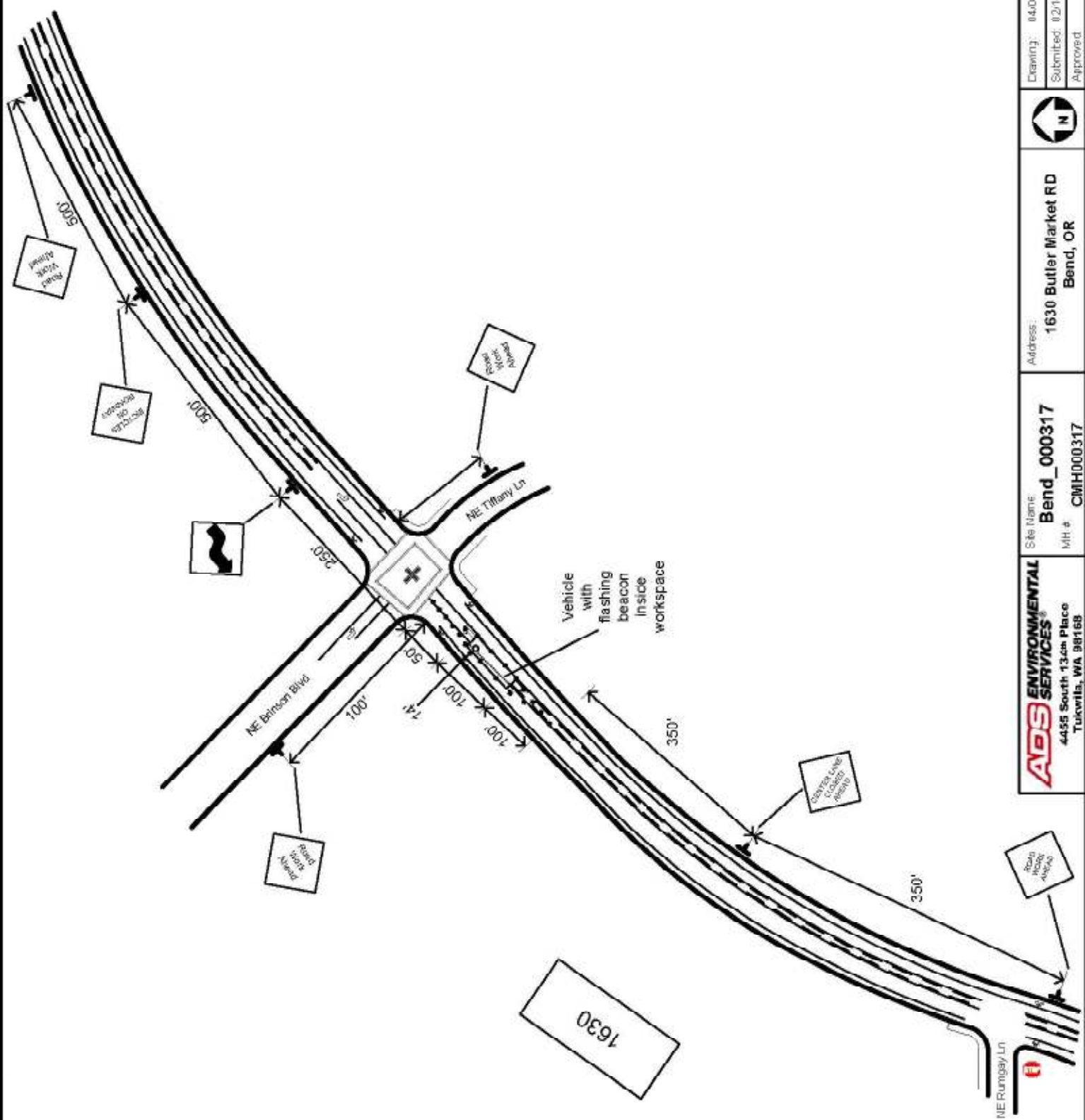
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/25/13





Office (206) 762-5070  
 Fax (206) 762-5077  
 24 hour contact  
 Daniel Sinkovich  
 (206) 255-4464

**Site Access**  
 2/14/13 – 4/13/13  
 7:00am – 4:00pm

Posted Speed Limit	
NE Butler Market Blvd	
N of NE Brinton Blvd	S of NE Brinton Blvd
<b>SPEED LIMIT 45</b>	<b>SPEED LIMIT 35</b>

<b>ADS ENVIRONMENTAL SERVICES</b> 4455 South 134th Place Tukwila, WA 98168	Site Name: <b>Bend_000317</b> MH # CMH000317	Address: <b>1630 Butler Market RD</b> <b>Bend, OR</b>		Drawing: 04/04/11 Submitted: 02/14/13 Approved:	Rev. 0 Pg. 1 of 1 Not To Scale	<b>Bend, OR</b> <b>Temporary Flow</b> <b>Monitoring</b>
--	--	---	--	---	--------------------------------------	---



Bend\_000317

Site location

**ADS ENVIRONMENTAL  
SERVICES®**



Site access

Site access looking west



Bend\_000317

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



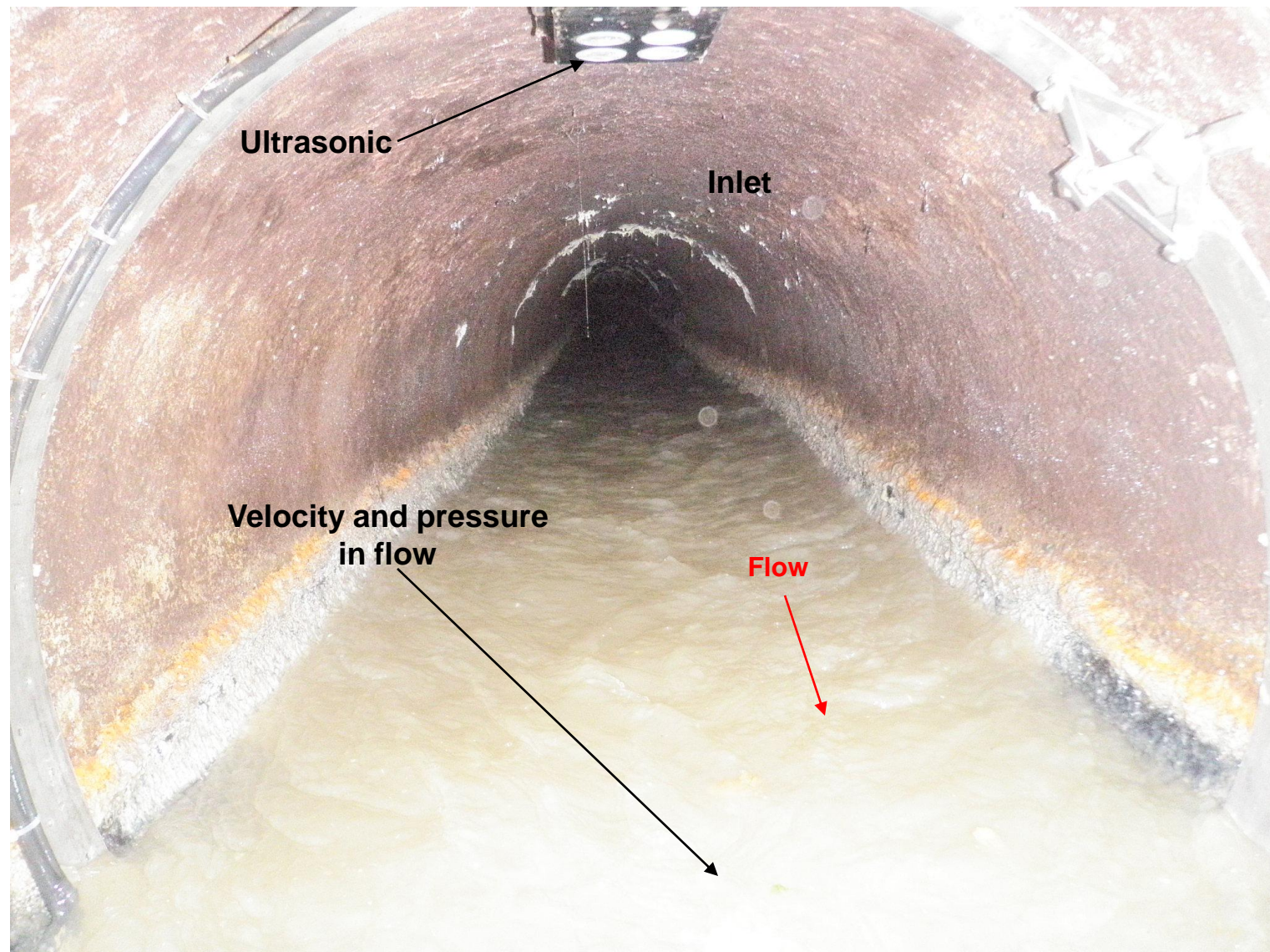
View down manhole facing north



Bend\_000317

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



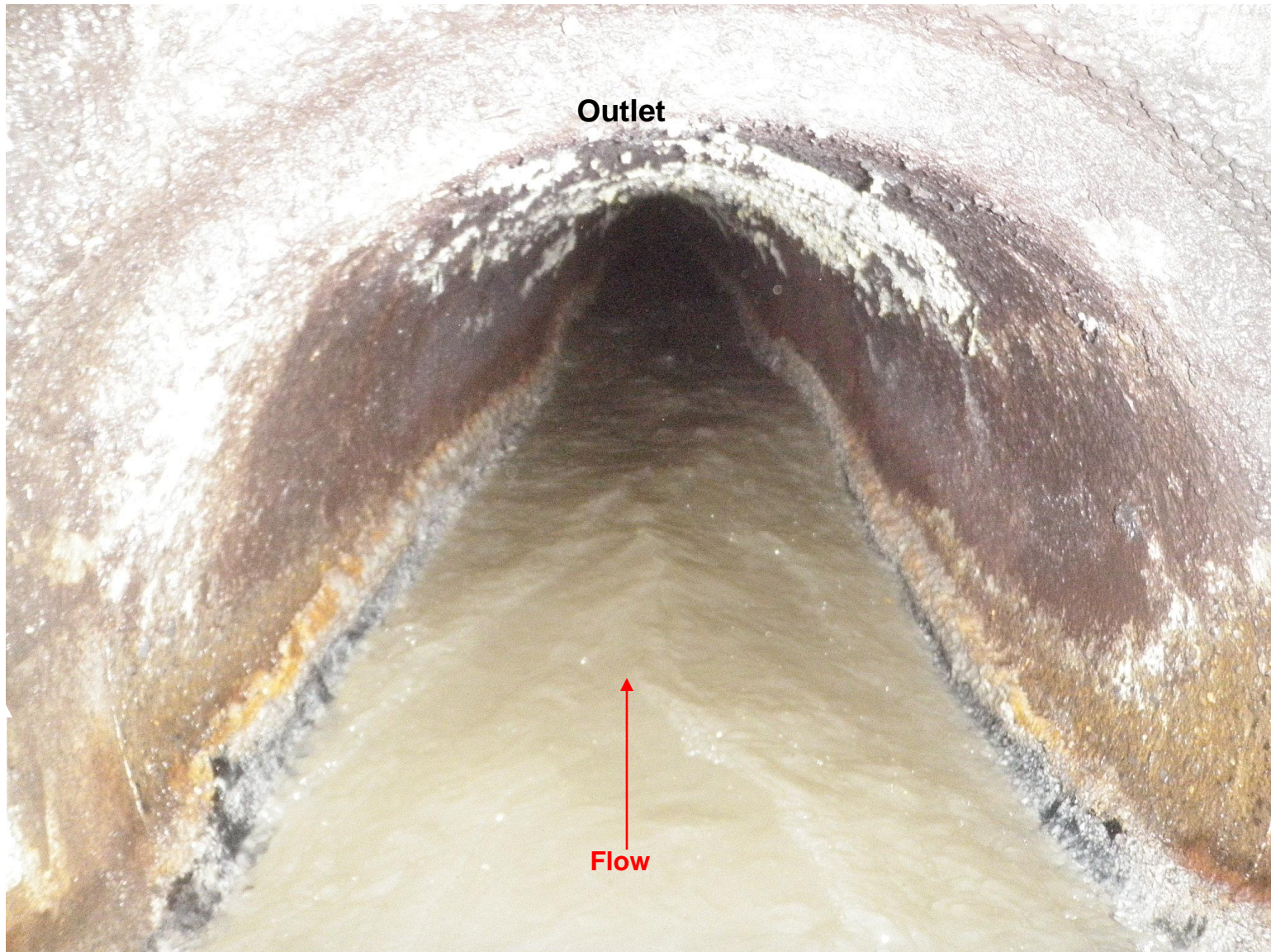
**View of sensor placement and site hydraulics**



Bend\_000317

Site outlet

**ADS ENVIRONMENTAL  
SERVICES®**



Outlet

Flow

View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_000317

## Flow Monitor

Bend\_000317

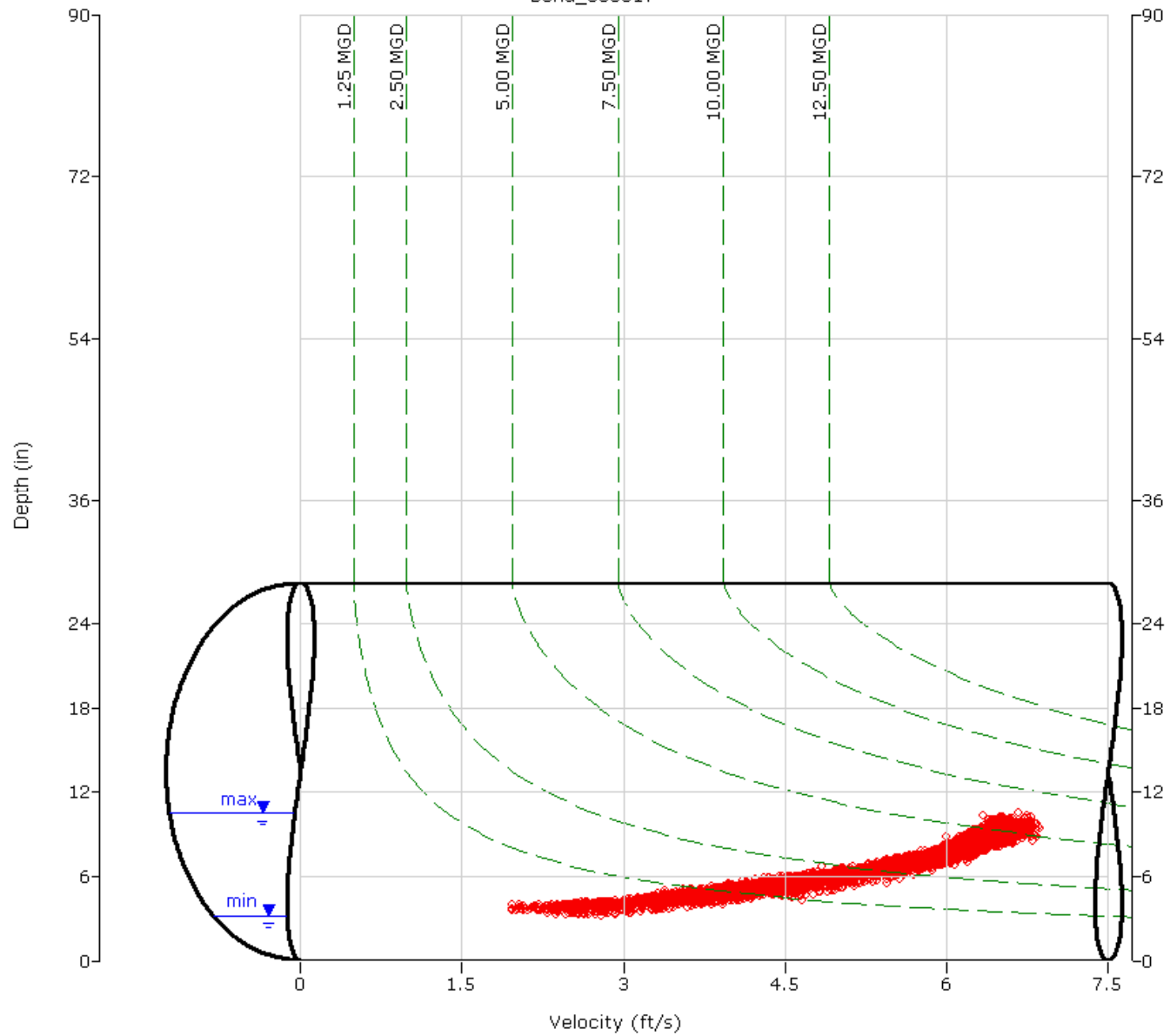
Pipe Height  
27.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_000317

## Flow Monitor

Bend\_000317

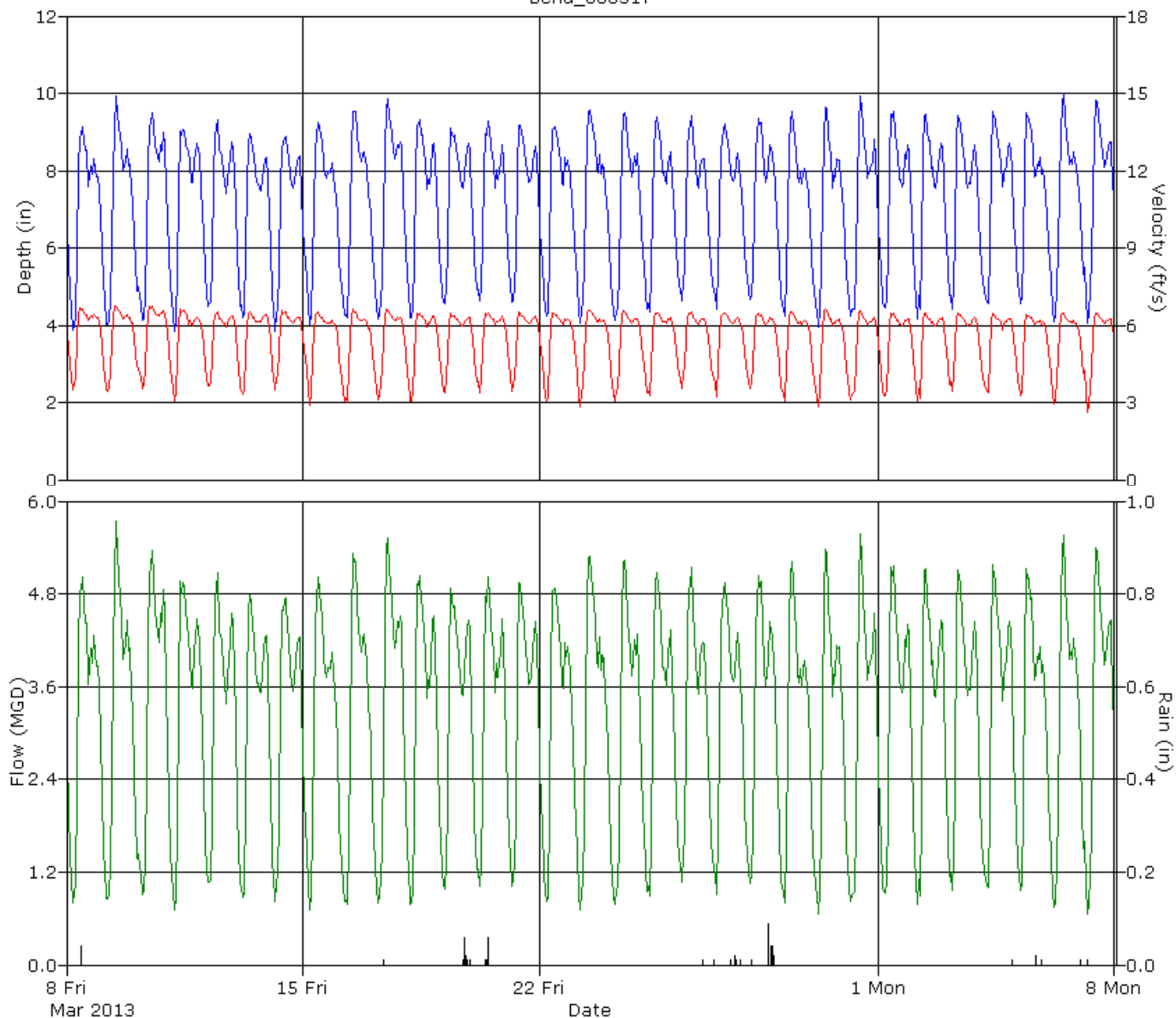
Pipe Height  
27.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_000642	
Measured Pipe Height (in)	7.88
Nominal Pipe Height (in)	8
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_000642 was located in the West of Bend (see attached site report for details).

The hydrograph indicates a residential/commercial diurnal flow pattern during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set, however the flow is shallow and very fast. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 10%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	0.40	5.25	0.026
Minimum	0.08	1.48	0.001
Maximum	1.55	7.90	0.198
Time of Minimum	4/3/2013 2:25 AM	3/28/2013 2:35 AM	3/20/2013 2:55 AM
Time of Maximum	3/12/2013 9:10 AM	3/21/2013 8:40 PM	3/12/2013 9:10 AM

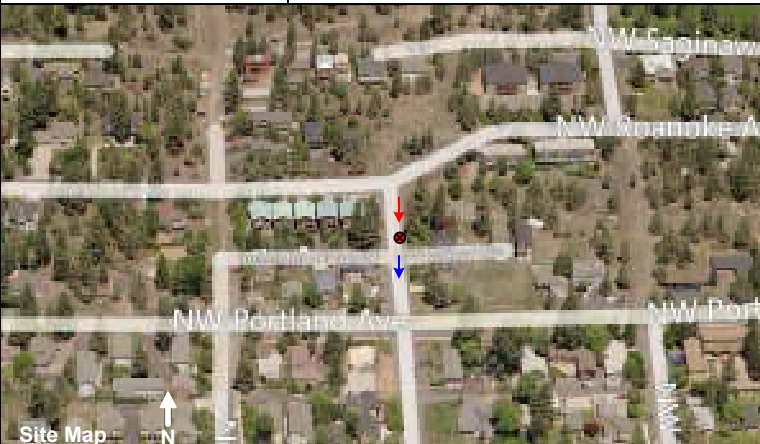
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	95
Velocity	100
Quantity	95



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_000642		Monitor Series: 5000 AG		Monitor S/N: 21507	
Address/Location: 1625 NW 11 <sup>th</sup> St		Manhole #		CMH000642	
		Coordinates:		44°03'52.89"N 121°19'39.39"W	
		Pipe Height:		7.88"	
Access: Drive		Type of System:		Pipe Width: 7.88"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.172.51	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/27/13 @ 10:53	Manhole Depth:	~ 5'
Site Hydraulics:	Low and fast	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	Did not investigate	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Back water observed	Telephone Information:	Doesn't apply
Depth of Flow:	0.75" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	7.13" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	5.50 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0" Inches	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_000642 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/27/13

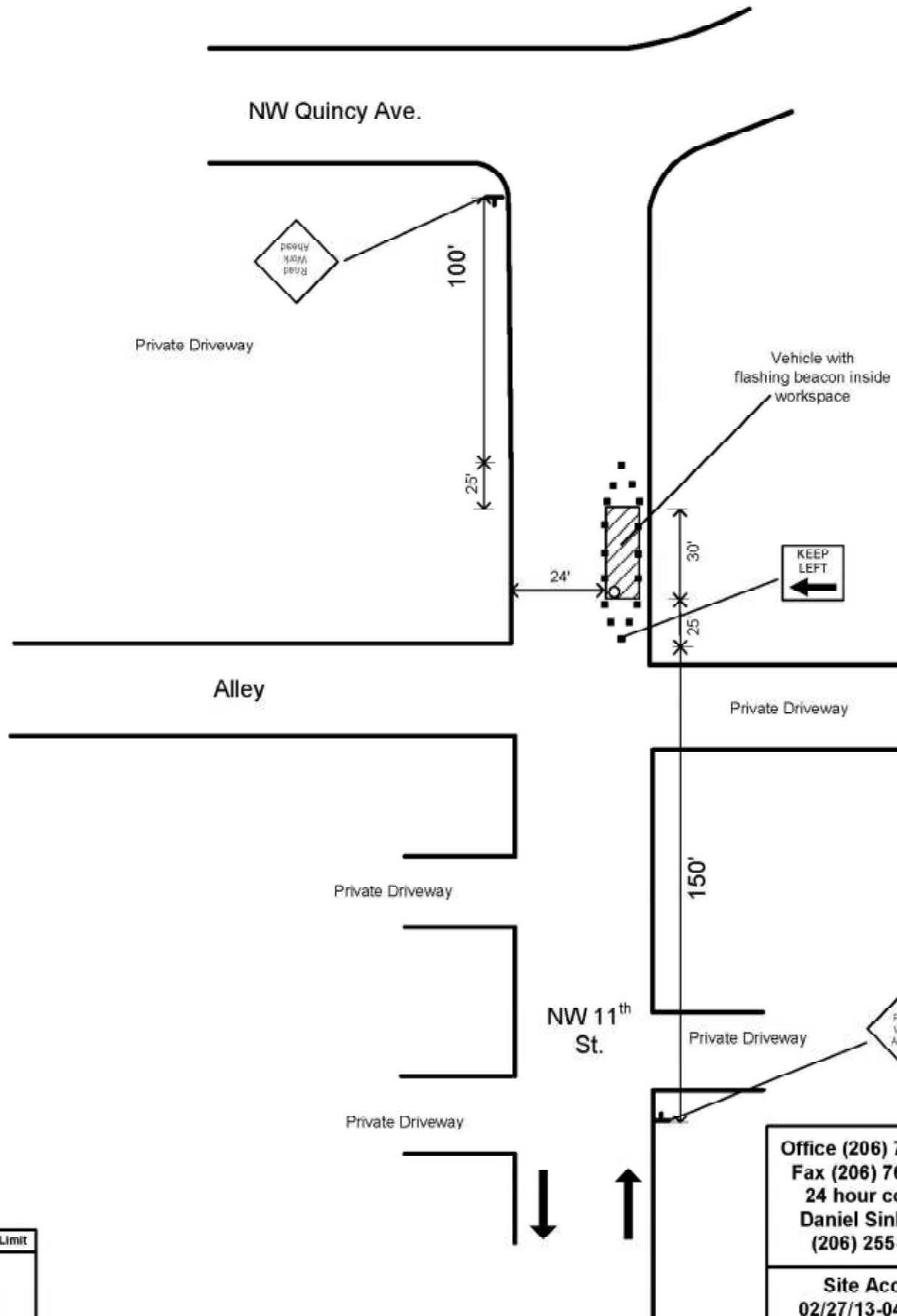
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/27/13





Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

Site Access  
02/27/13-04/13/13  
7:00am-5:00pm



Bend\_000642

Site location

**ADS ENVIRONMENTAL  
SERVICES®**



Site access

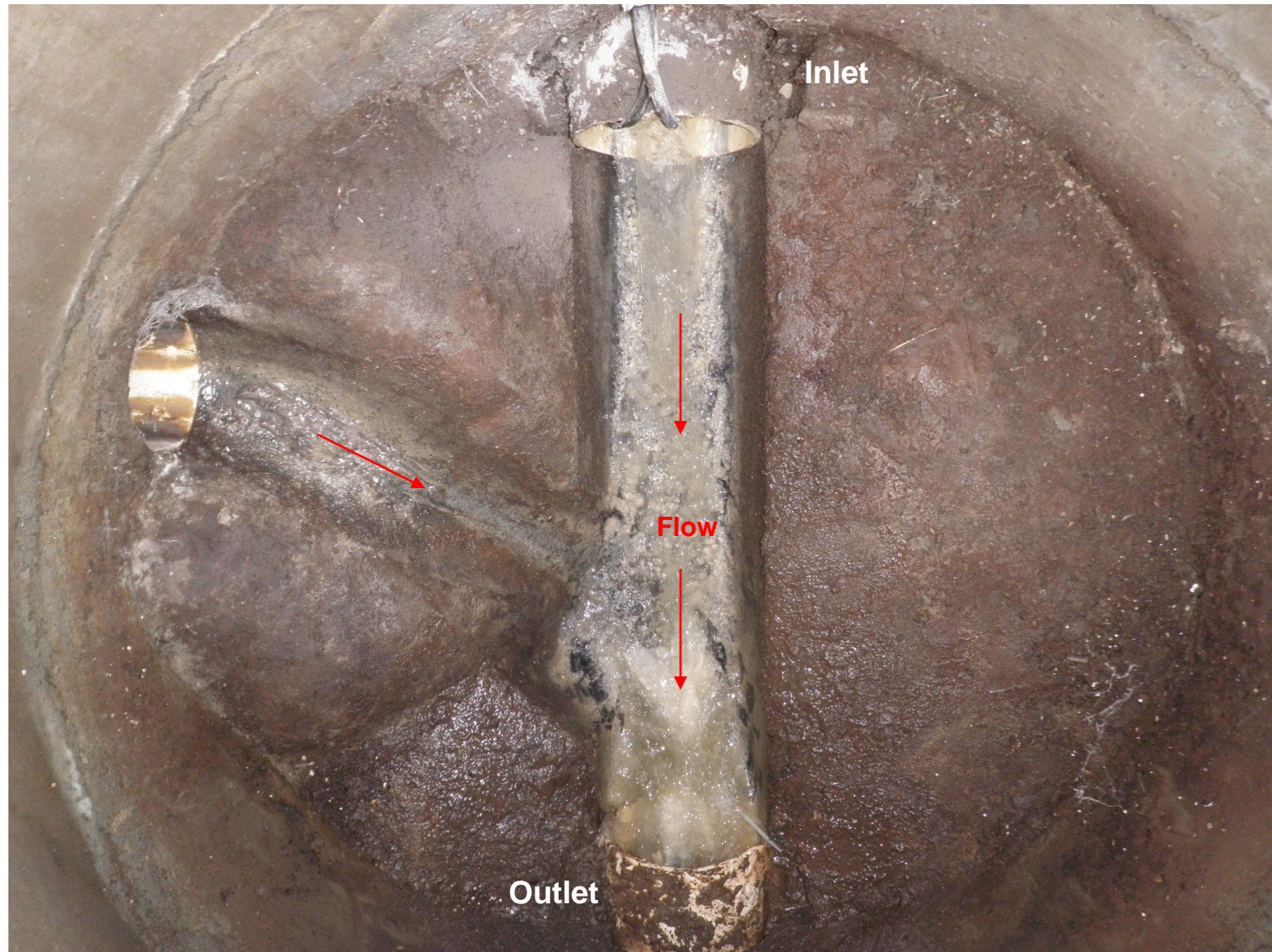
Site access looking northeast



Bend\_000642

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



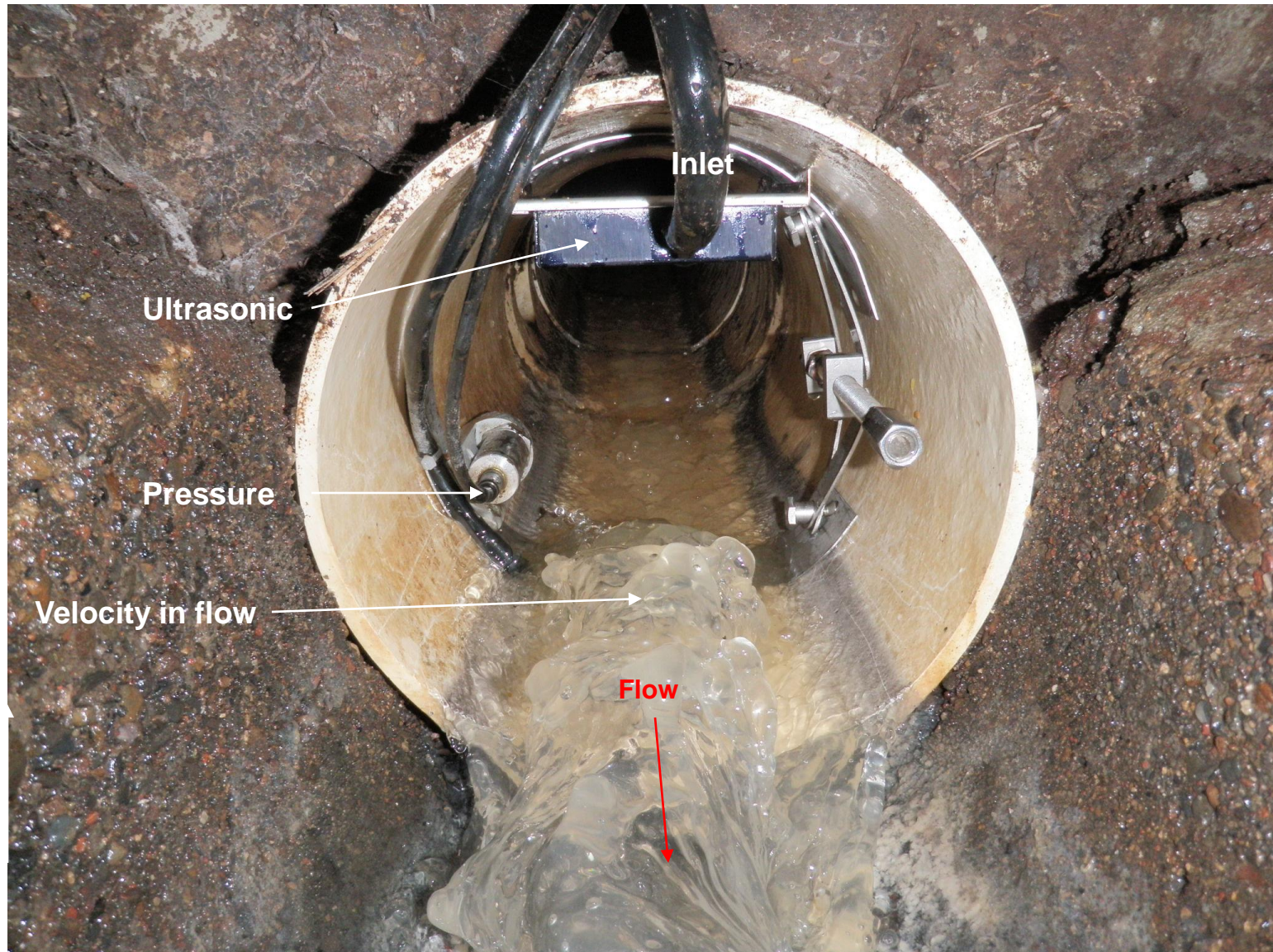
View down manhole facing northeast



Bend\_000642

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of sensor placement and site hydraulics



Bend\_000642

Site outlet

**ADS ENVIRONMENTAL  
SERVICES®**



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_000642

## Flow Monitor

Bend\_000642

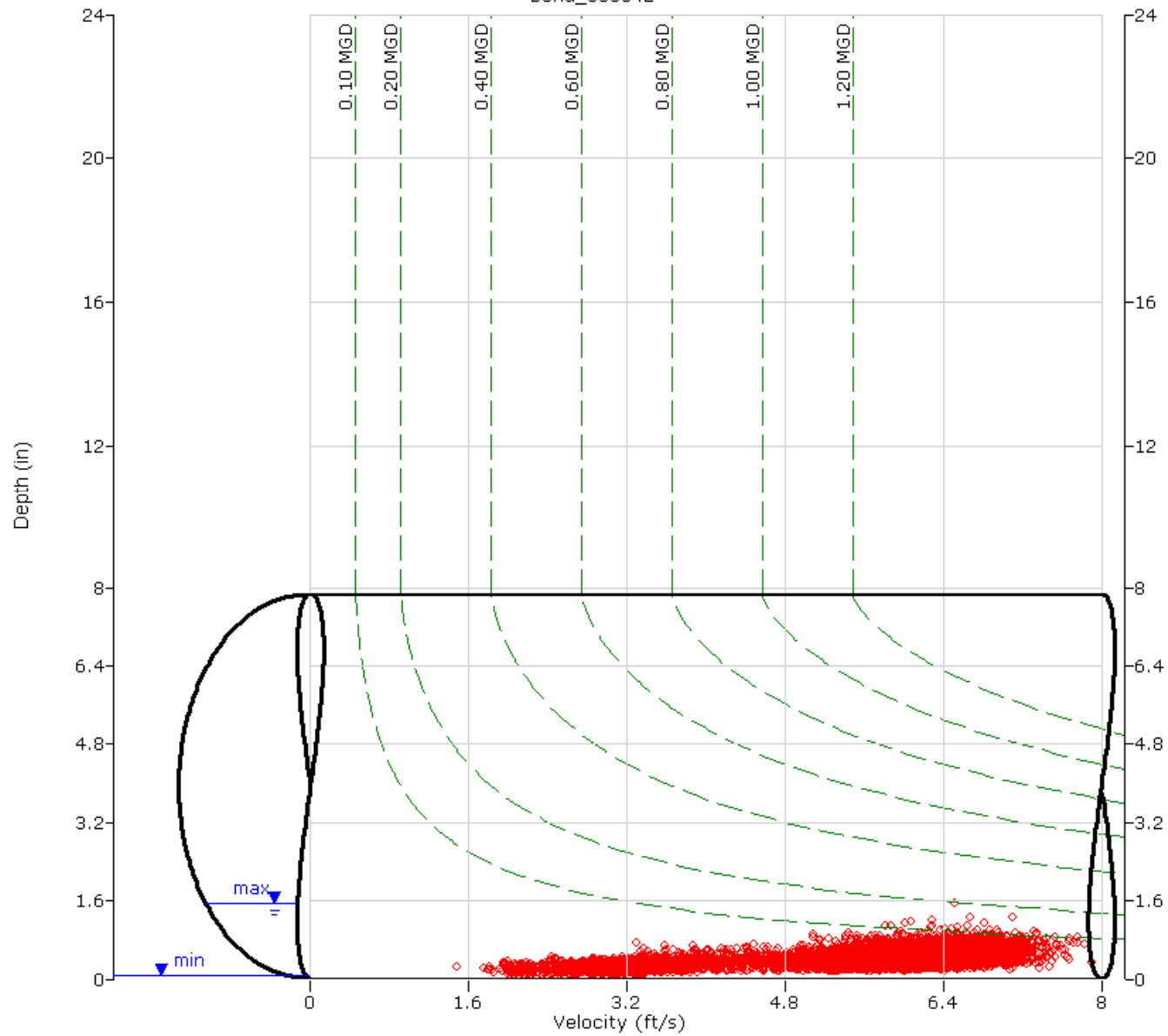
Pipe Height  
7.88 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_000642

## Flow Monitor

Bend\_000642

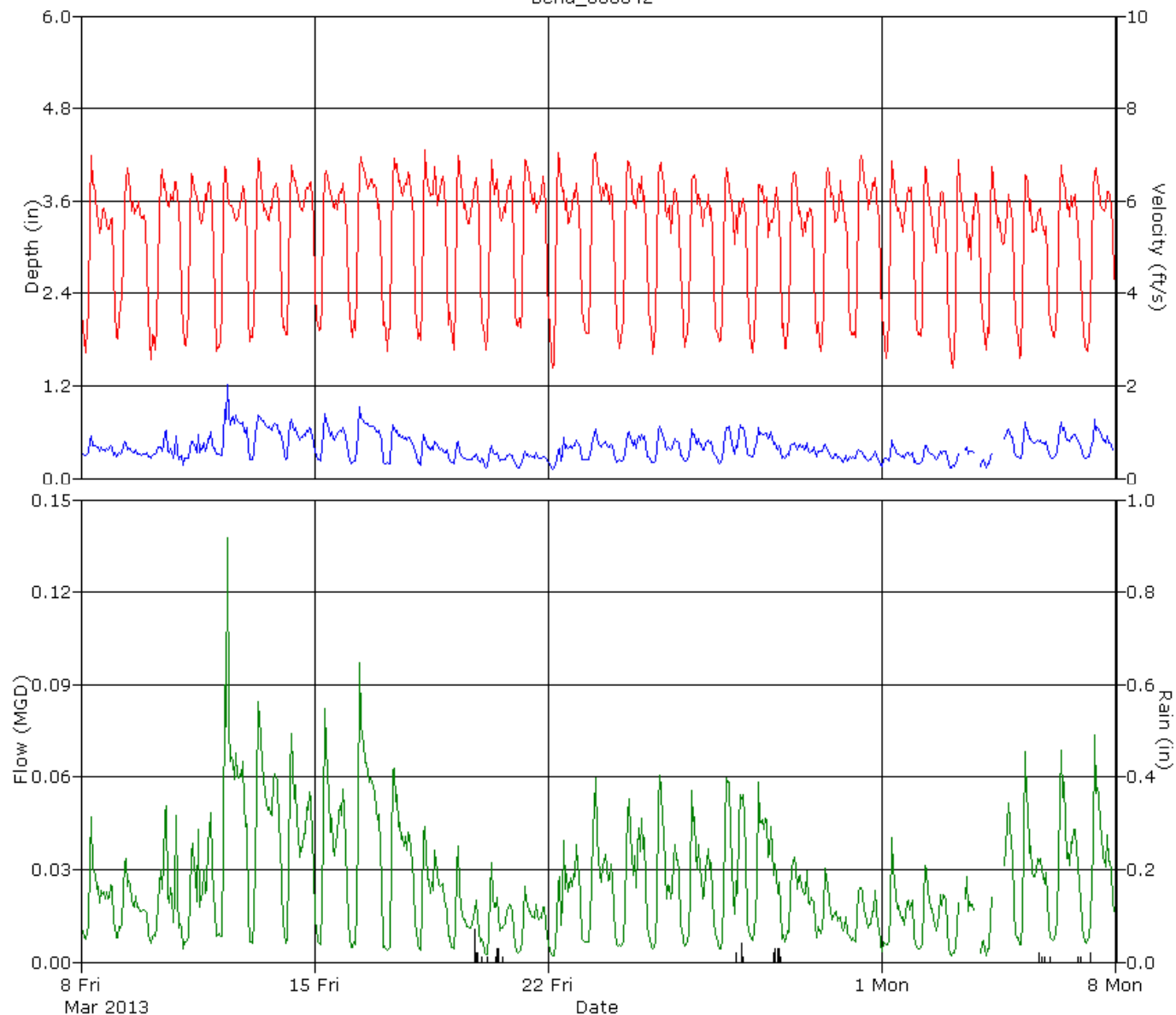
Pipe Height  
7.88 in.

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_000889	
Measured Pipe Height (in)	17.38
Nominal Pipe Height (in)	18
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_000889 was located in the Northeast of Bend (see attached site report for details).

The hydrograph indicates a residential/commercial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.03	0.81	0.109
Minimum	1.98	0.21	0.018
Maximum	4.33	1.51	0.288
Time of Minimum	3/8/2013 5:00 AM	3/22/2013 2:45 AM	3/22/2013 2:45 AM
Time of Maximum	4/5/2013 8:30 AM	3/18/2013 8:25 AM	4/5/2013 8:30 AM

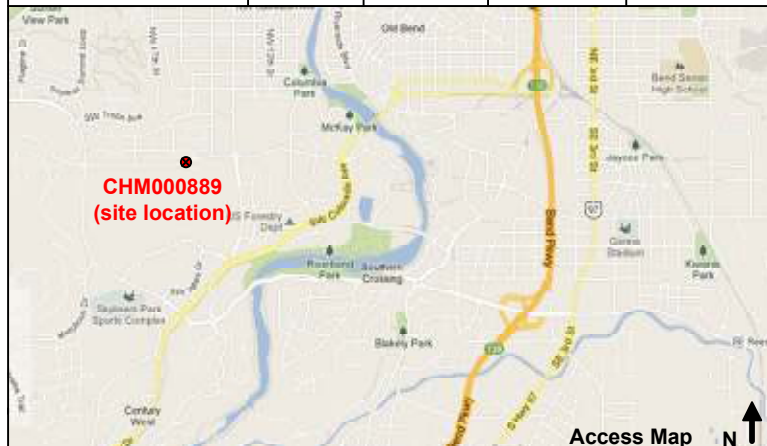
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_000889		Monitor Series: 5000 AG		Monitor S/N: 20024	
Address/Location: 1640 SW Simpson Dr.		Manhole #		CMH000889	
		Coordinates:		44° 2'50.66"N 121°20'9.42"W	
		Pipe Height:		17.38"	
Access: Drive		Type of System:		Pipe Width: 17.50"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.172.52	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/24/13 @ 09:34	Manhole Depth:	~ 6'
Site Hydraulics:	Smooth	Manhole Material / Condition	PVC / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Small waves	Telephone Information:	Doesn't apply
Depth of Flow:	3.25" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	14.13" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.15 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_000889 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/24/13

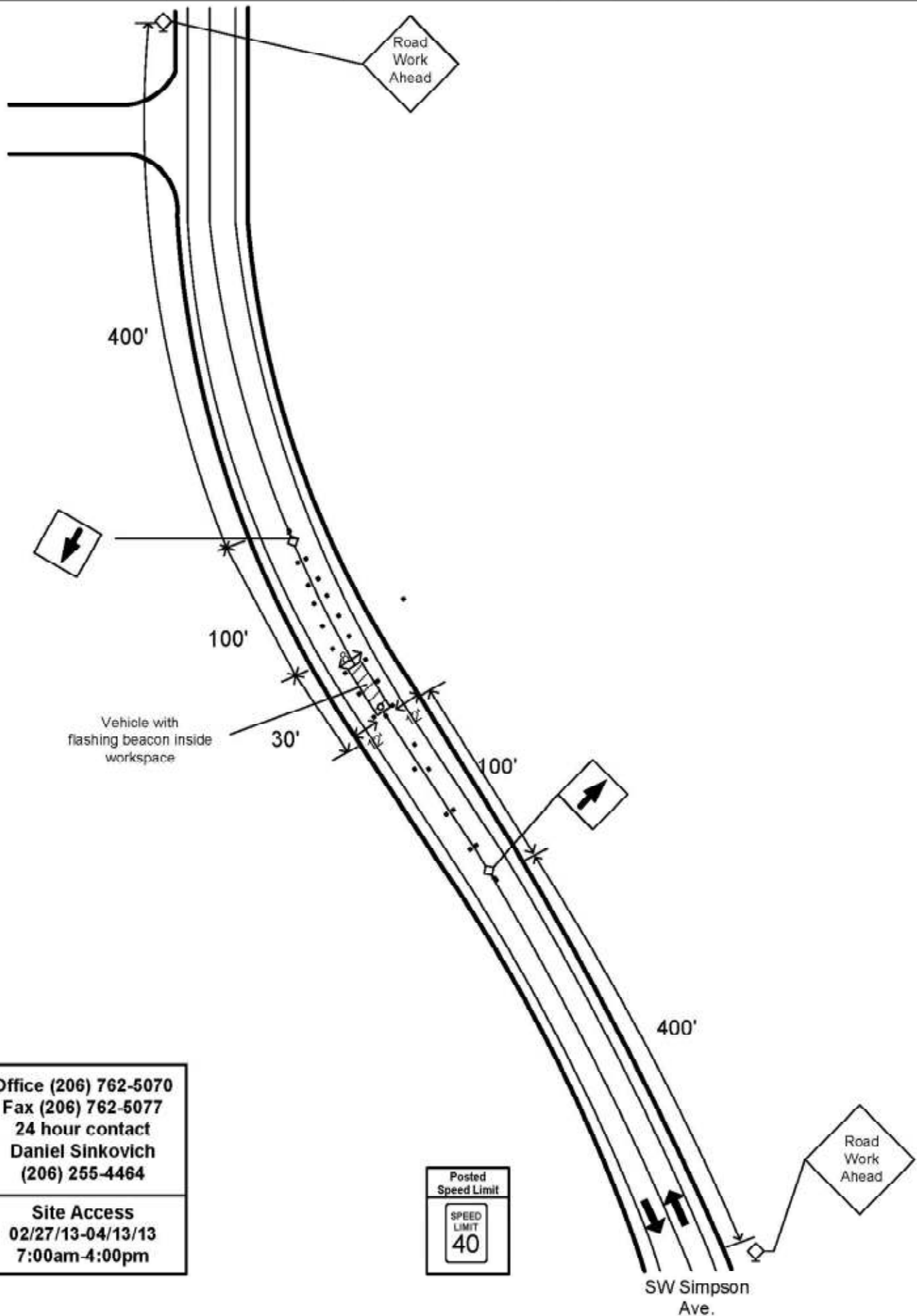
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/24/13





Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

Site Access  
02/27/13-04/13/13  
7:00am-4:00pm



Bend\_000889

Site location

**ADS** ENVIRONMENTAL  
SERVICES®



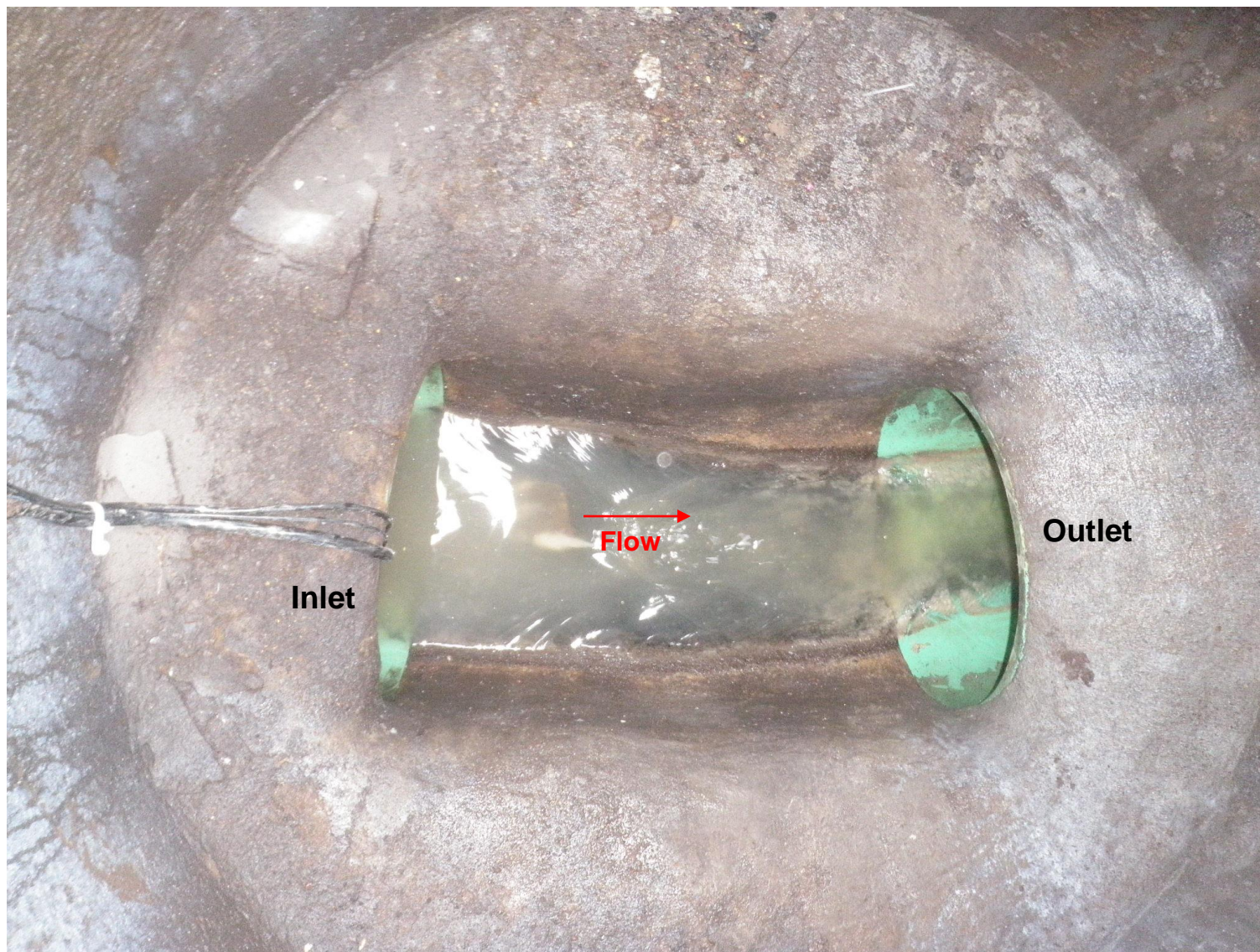
Site access looking northeast



Bend\_000889

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



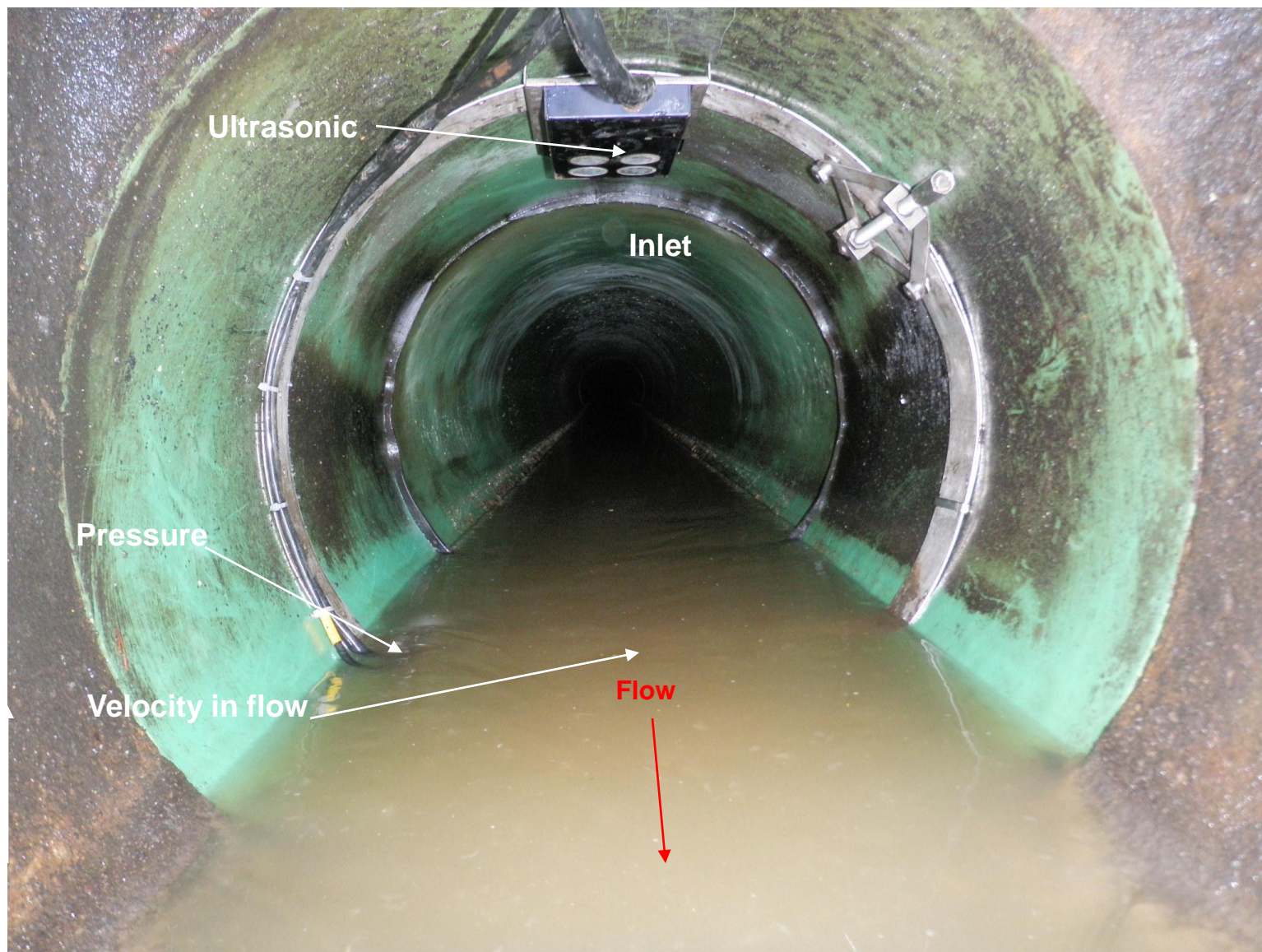
View down manhole facing north



Bend\_000889

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of sensor placement and site hydraulics



Bend\_000889

Site outlet

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_000889

## Flow Monitor

Bend\_000889

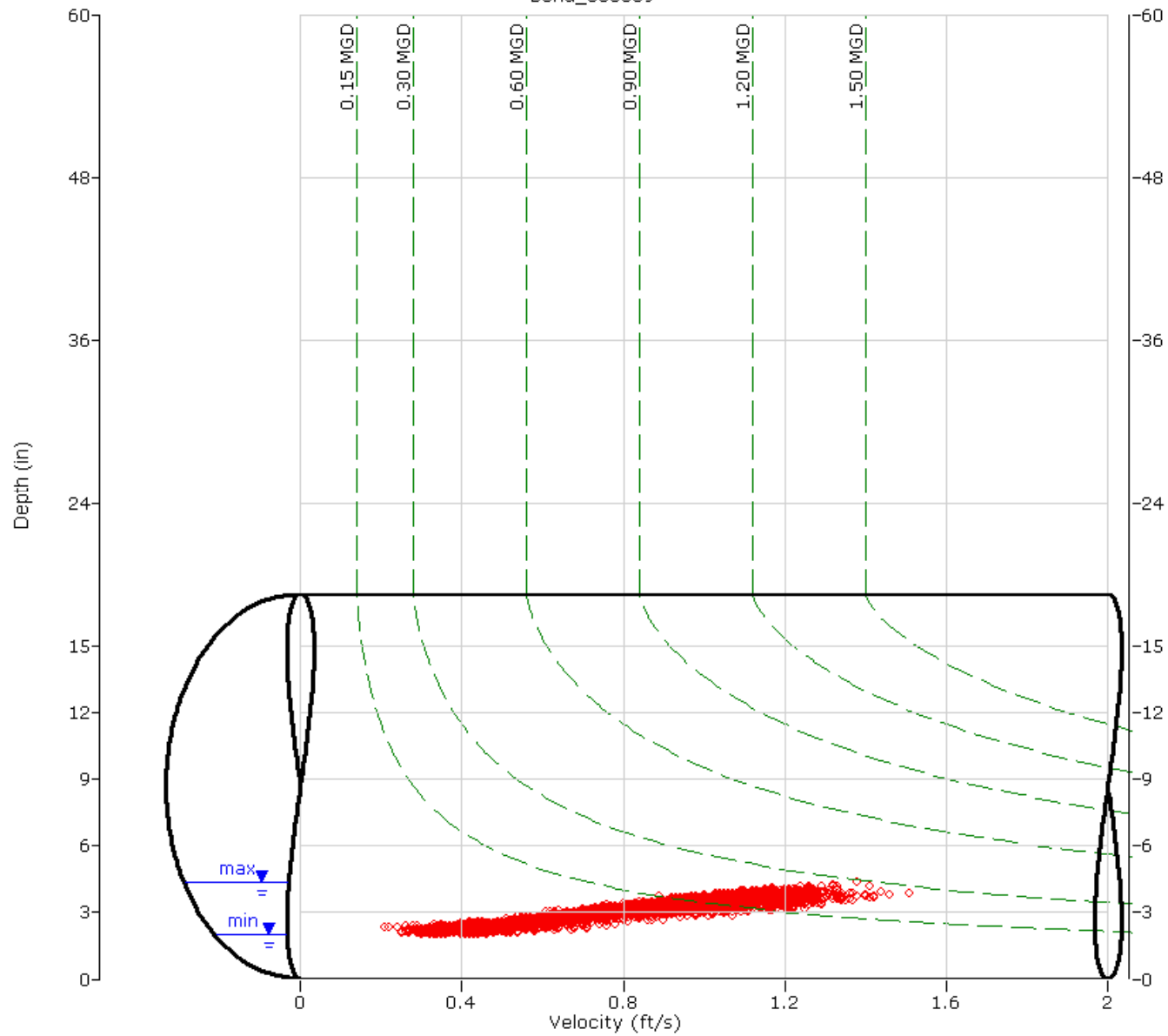
Pipe Height  
17.38 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_000889

## Flow Monitor

Bend\_000889

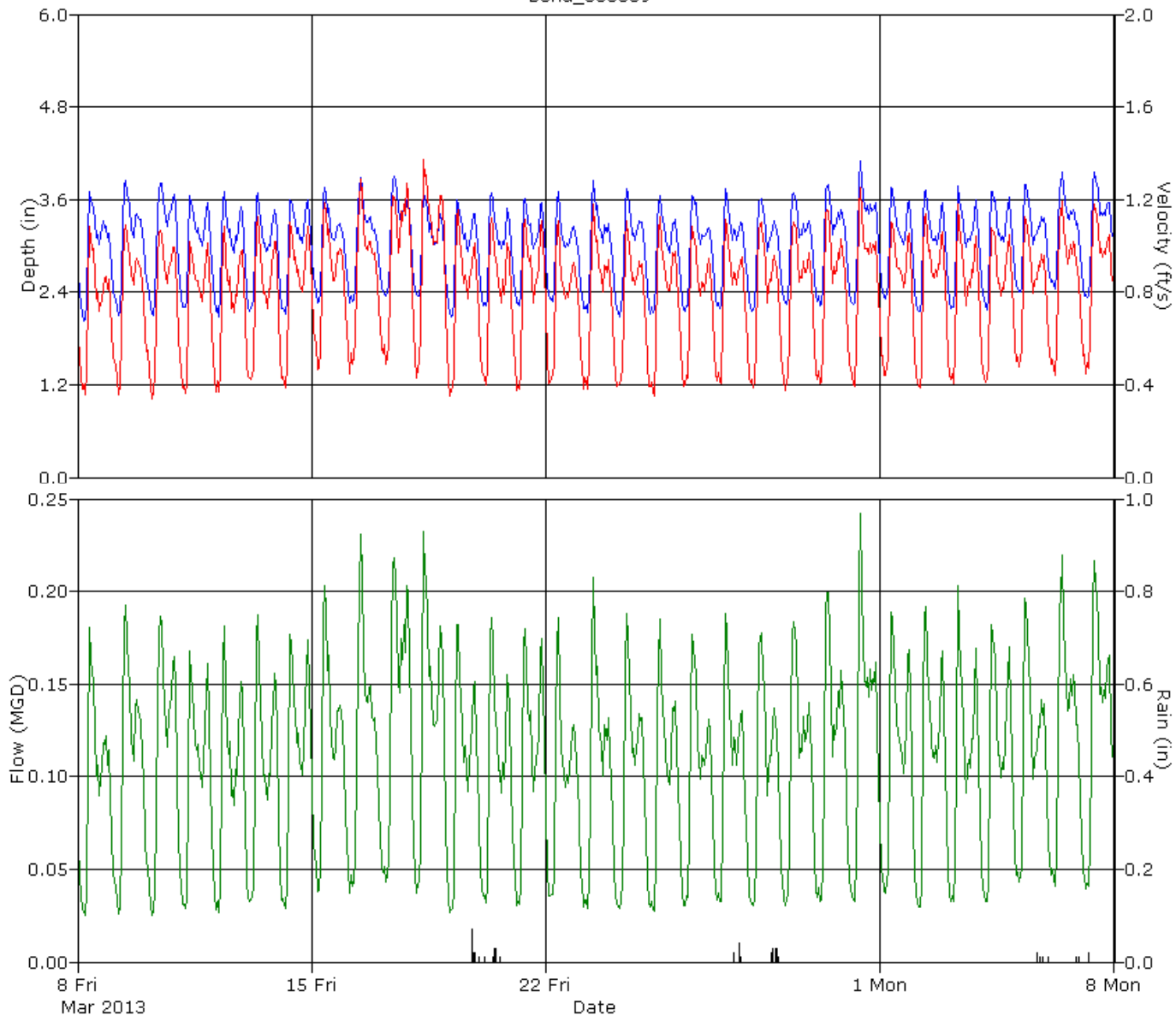
Pipe Height  
17.38 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_001204	
Measured Pipe Height (in)	7.88
Nominal Pipe Height (in)	8
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_001204 was located in the Northeast of Bend (see attached site report for details).

The hydrograph indicates a commercial diurnal flow pattern during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a fairly repeatable data set however the scattergraph is somewhat vertical (1" depth range with 0.5 - 5ft/s velocity range). The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 8%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.67	2.90	0.104
Minimum	0.86	0.44	0.008
Maximum	2.71	5.68	0.281
Time of Minimum	3/9/2013 2:00 AM	4/3/2013 3:45 AM	4/3/2013 3:45 AM
Time of Maximum	3/17/2013 11:55 AM	3/9/2013 10:25 AM	3/17/2013 10:40 AM

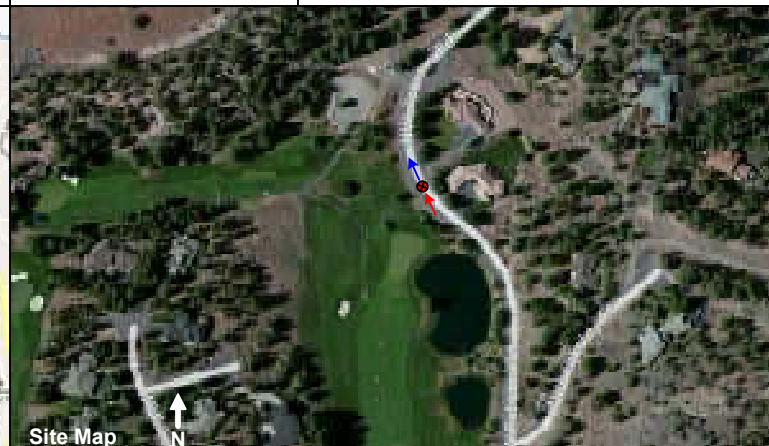
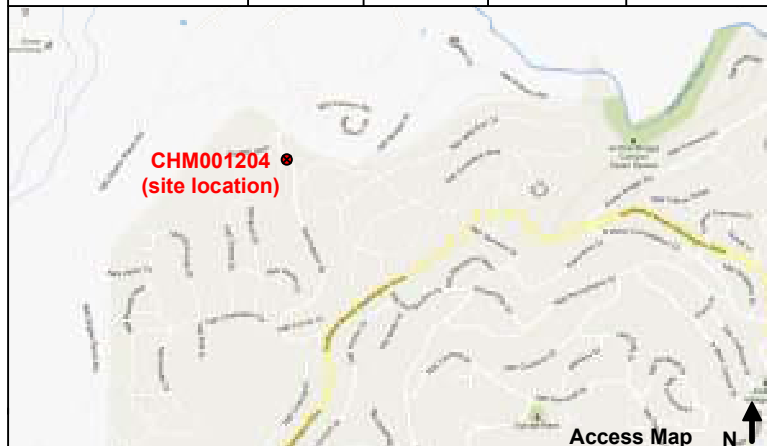
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	96
Velocity	100
Quantity	96



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_001204		Monitor Series: 5000 AG		Monitor S/N: 21476	
Address/Location: 2260 Northwest Putnam Road		Manhole #		CMH001204	
		Coordinates:		44°05'29.72"N 121°20'54.09"W	
		Pipe Height:		7.88"	
Access: Drive		Type of System:		Pipe Width: 7.88"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.172.5	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/27/13 @ 09:00	Manhole Depth:	~9'
Site Hydraulics:	Small waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	Small waves and slight bend	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Small waves	Telephone Information:	Doesn't apply
Depth of Flow:	1.75" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	6.13" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	4.60 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultrasonic, Velocity, Pressure	Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height:	None observed	WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	Bend_RWRG	Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:	
5 PSI pressure used at this location	



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_001204 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/27/13

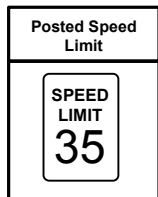
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/27/13







Bend\_001204

Site location

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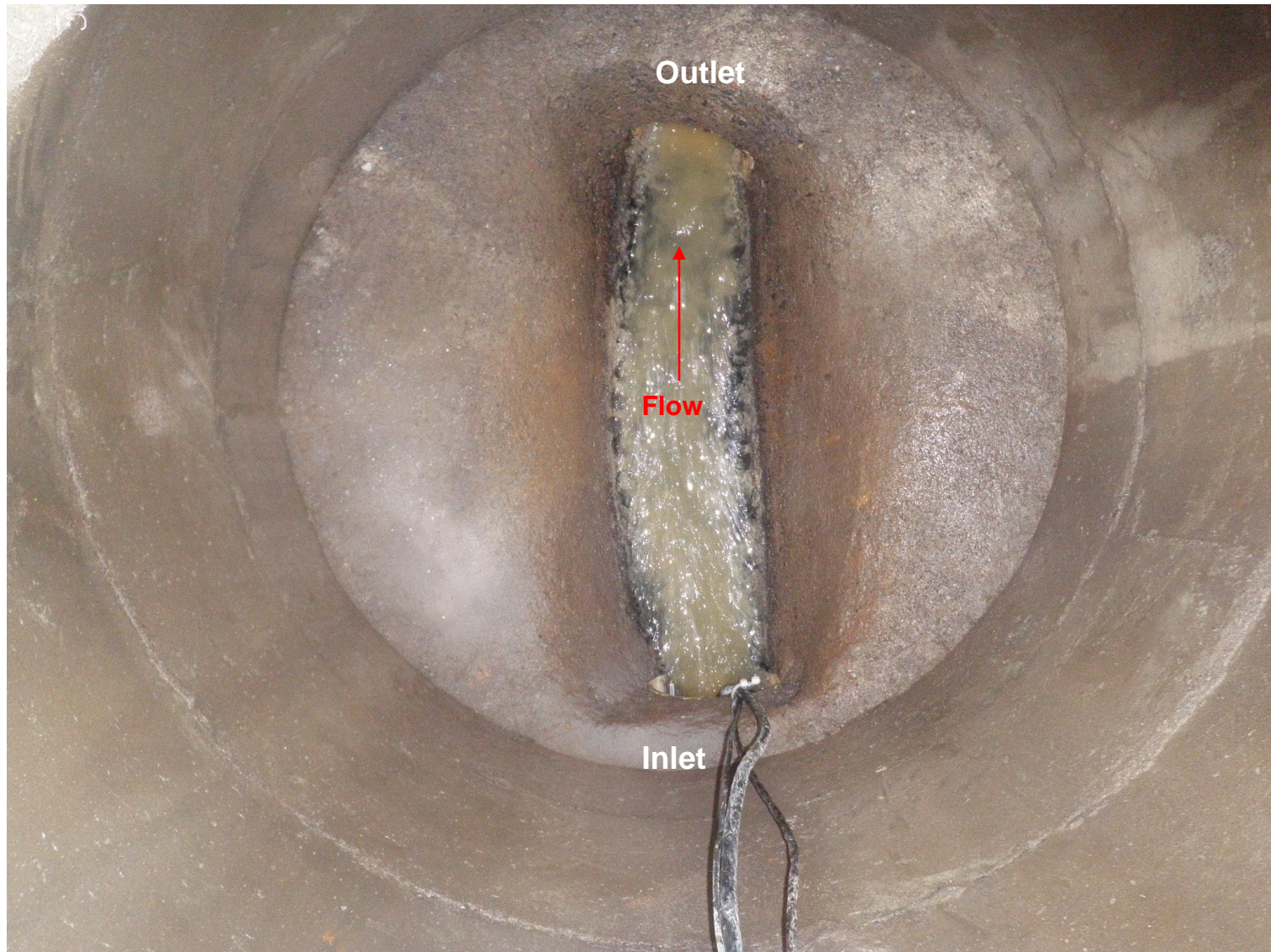
Site access looking northeast



Bend\_001204

Site set up

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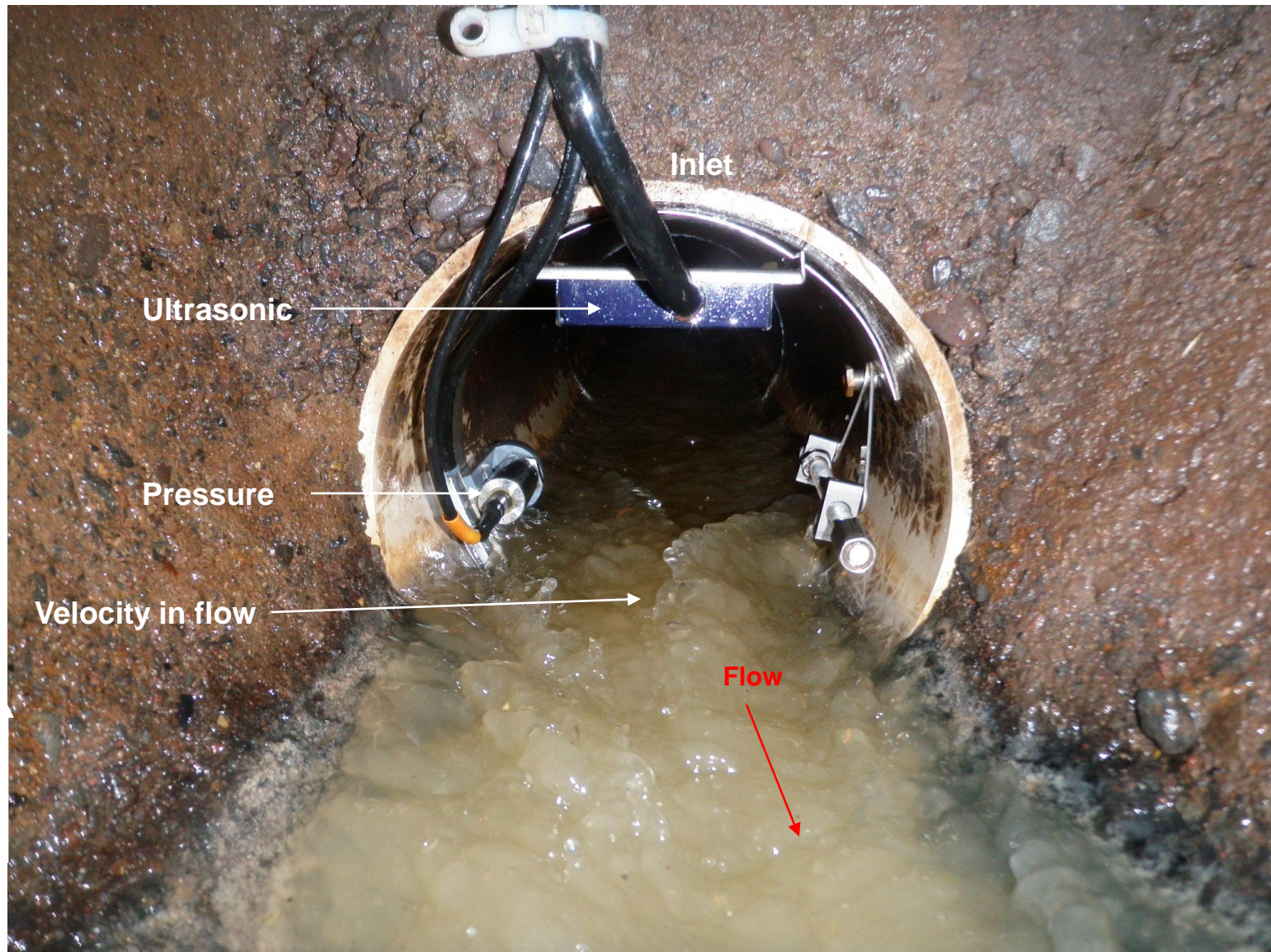
View down manhole facing northeast



Bend\_001204

Site set up

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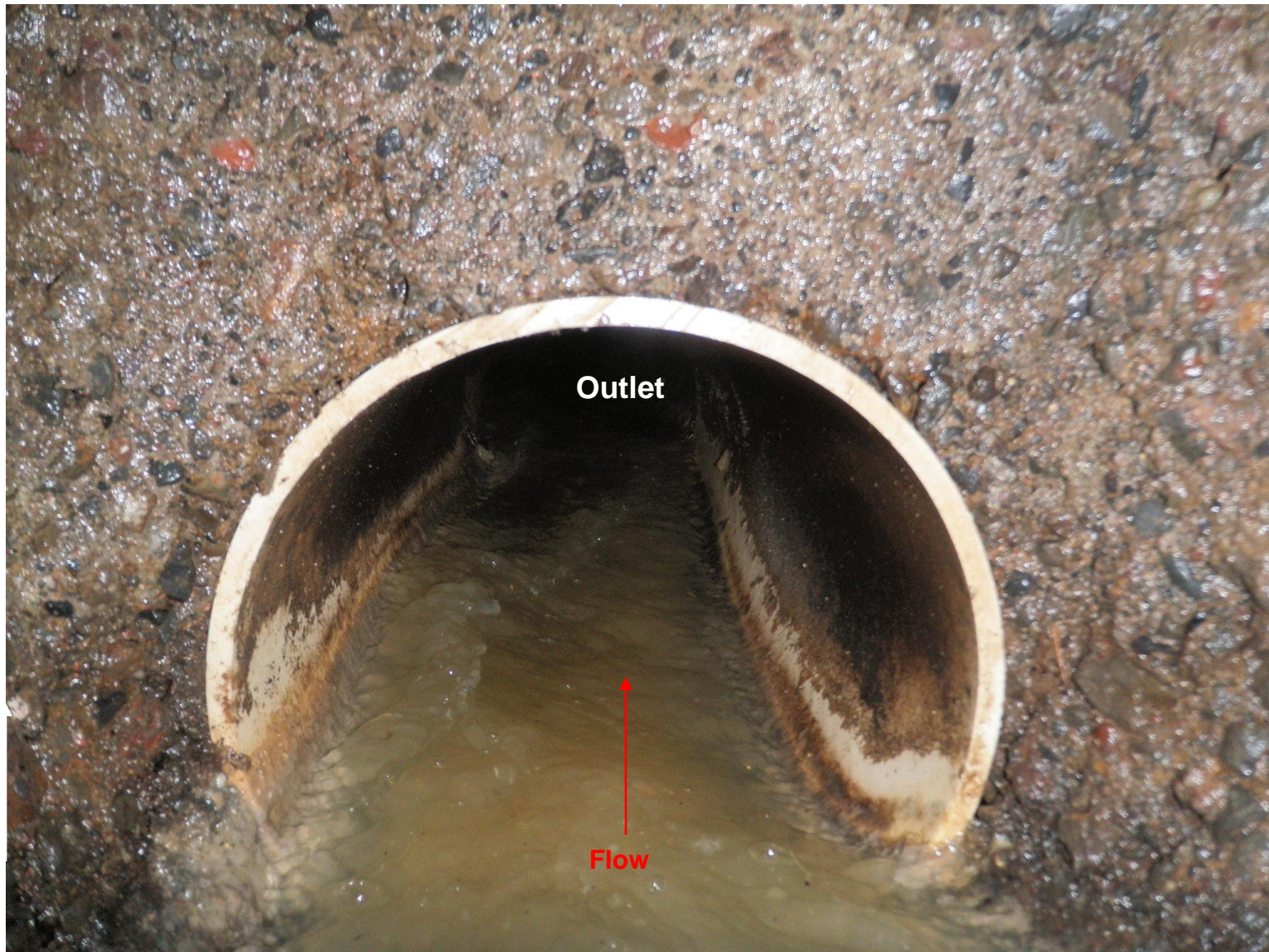
View of sensor placement and site hydraulics



Bend\_001204

Site outlet

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View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_001204

## Flow Monitor

Bend\_001204

Pipe Height  
7.88 in

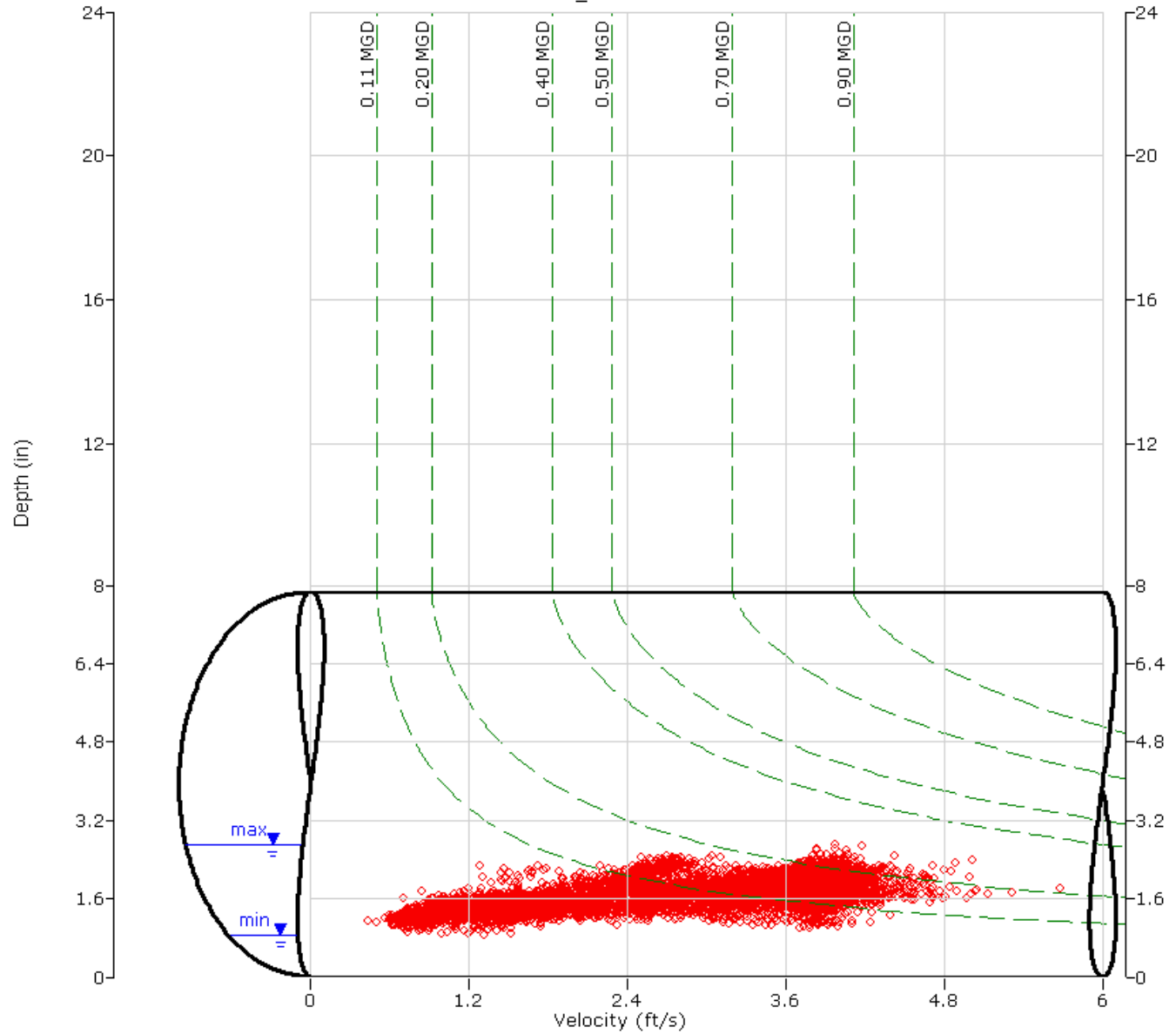
## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth

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# HYDROGRAPH REPORT

Bend\_001204

## Flow Monitor

Bend\_001204

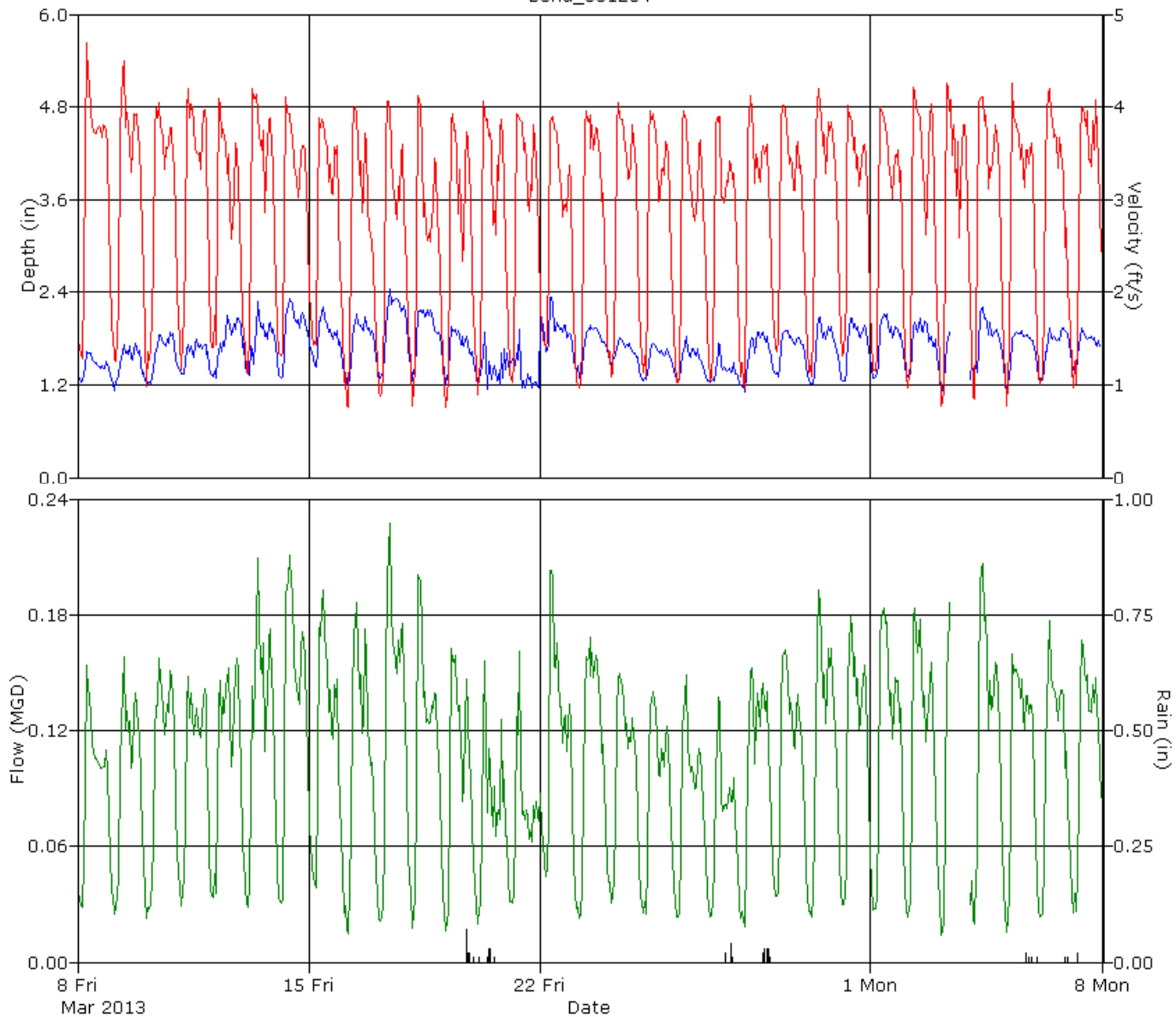
Pipe Height  
7.88 in.

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_001393	
Measured Pipe Height (in)	7.88
Nominal Pipe Height (in)	8
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_001393 was located in the Southeast of Bend (see attached site report for details).

The hydrograph indicates a residential/commercial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set, with a slight hydraulic shift present. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 8%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.68	0.87	0.066
Minimum	1.22	0.22	0.006
Maximum	4.99	1.98	0.260
Time of Minimum	3/29/2013 3:06 AM	3/27/2013 2:08 AM	3/23/2013 3:12 AM
Time of Maximum	3/16/2013 11:50 AM	3/9/2013 11:00 AM	3/9/2013 11:00 AM

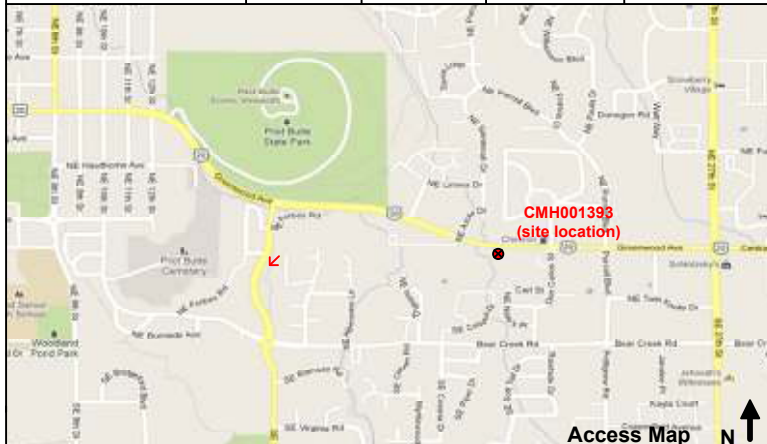
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_001393		Monitor Series: 5000 AG		Monitor S/N: 21498	
Address/Location: 2099 Greenwood Ave.		Manhole #		CMH001393	
		Coordinates:		44°03'17.20"N 121°16'25.07"W	
		Pipe Height:		7.88"	
Access: Drive		Type of System:		Pipe Width: 7.88"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.172.37	

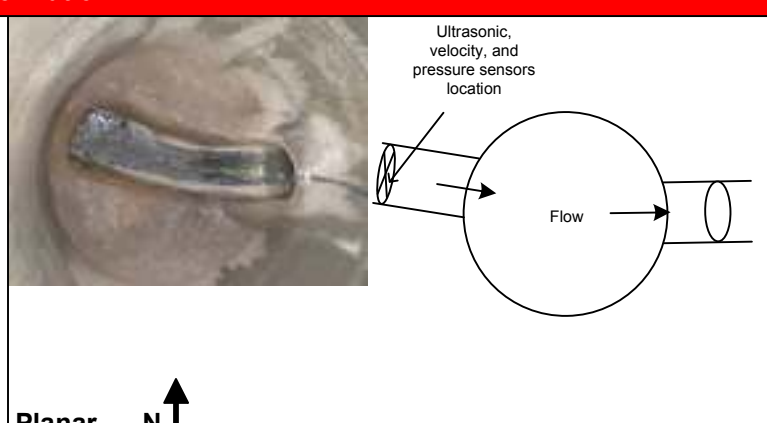
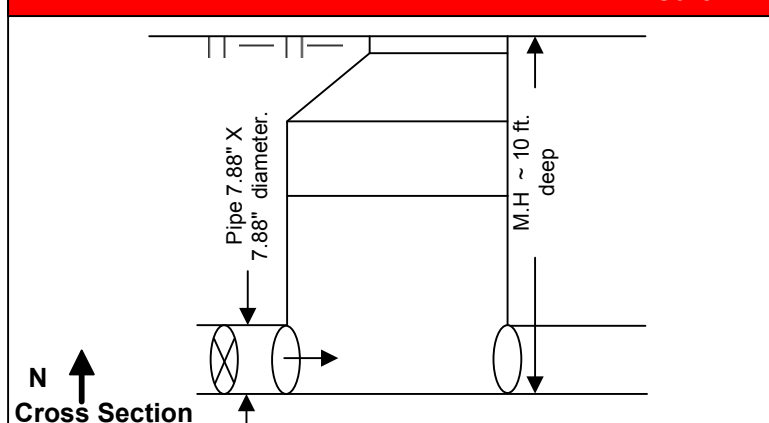


### Investigation Information:

### Manhole Information:

Date/Time of Investigation:	3/6/2013 @ 9:08	Manhole Depth:	~ 10'		
Site Hydraulics:	Smooth	Manhole Material / Condition	Concrete / Good		
Upstream Input: (L/S, P/S)	No influence	Pipe Material / Condition:	PVC / Good		
Upstream Manhole:	DNI	Mini System Character:	Residential <input checked="" type="checkbox"/>	Commercial <input checked="" type="checkbox"/>	Industrial <input type="checkbox"/>
			Trunk <input type="checkbox"/>		
Downstream Manhole:	Small waves	Telephone Information:	Doesn't apply		
Depth of Flow:	2.25" +/- 0.25"	Access Pole #:	Doesn't apply		
Range (Air DOF):	5.33" +/- 0.25"	Distance From Manhole:	Doesn't apply	Feet	
Peak Velocity:	1.25 fps	Road Cut Length:	Doesn't apply	Feet	
Silt:	0.00"	Trench Length:	Doesn't apply	Feet	

### Other Information:



Installation Information		Backup	Yes	No	?	Distance
Installation Type: Standard		Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure		Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed		WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_SGRG		Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

### Additional Site Information / Comments:

5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_001393 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only.

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☒ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Dan Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 3/6/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 3/6/13



Bend\_001393

Site Access

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Site Location

Greenwood Ave (HWY 20)

Site access looking west



Bend\_001393

Site set up

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SERVICES®**



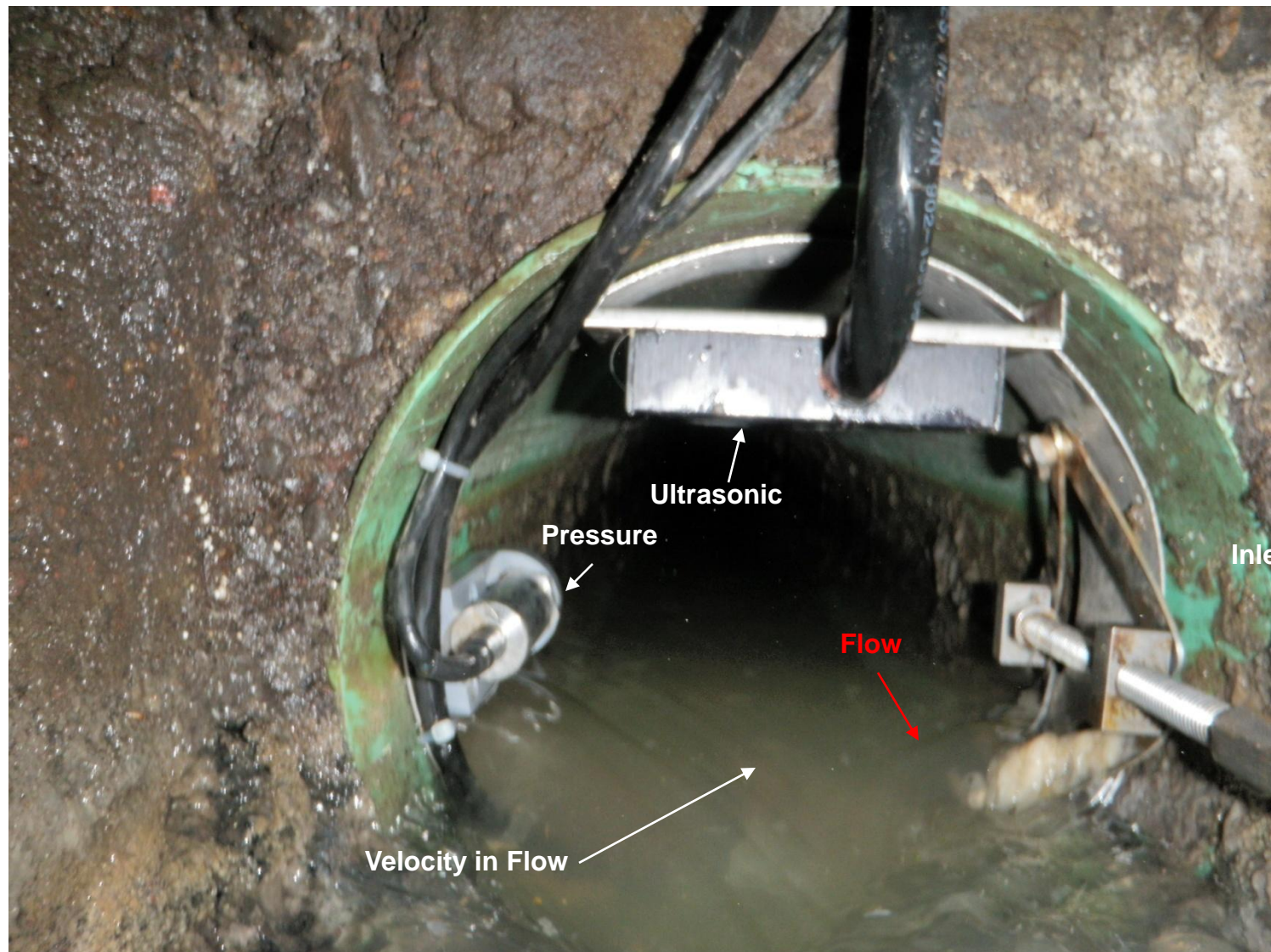
View of site looking north



Bend\_001393

Site set up

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View of inlet and sensors



Bend\_001393

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet



# SCATTERGRAPH REPORT

Bend\_001393

## Flow Monitor

Bend\_001393

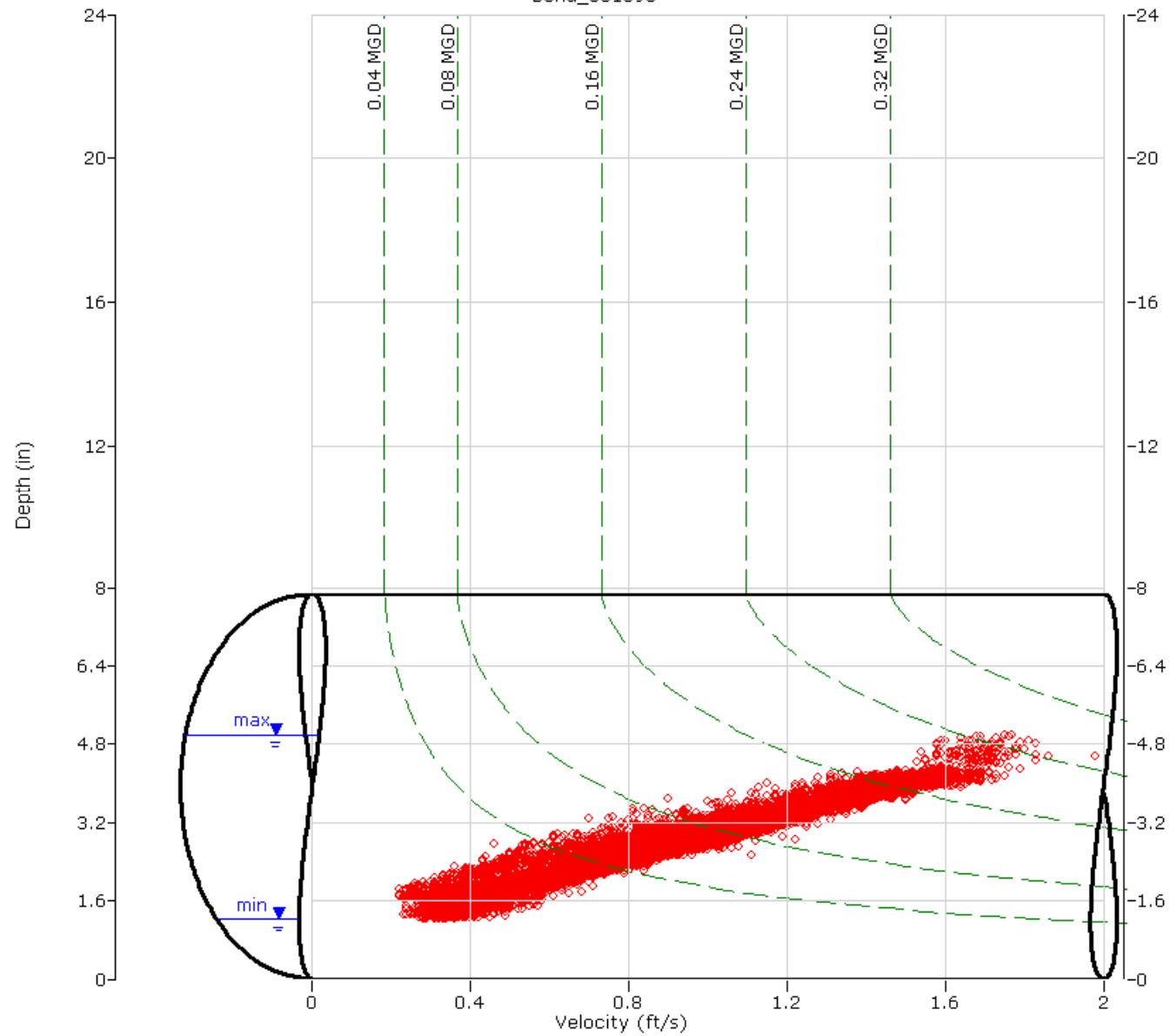
Pipe Height  
7.88 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_001393

## Flow Monitor

Bend\_001393

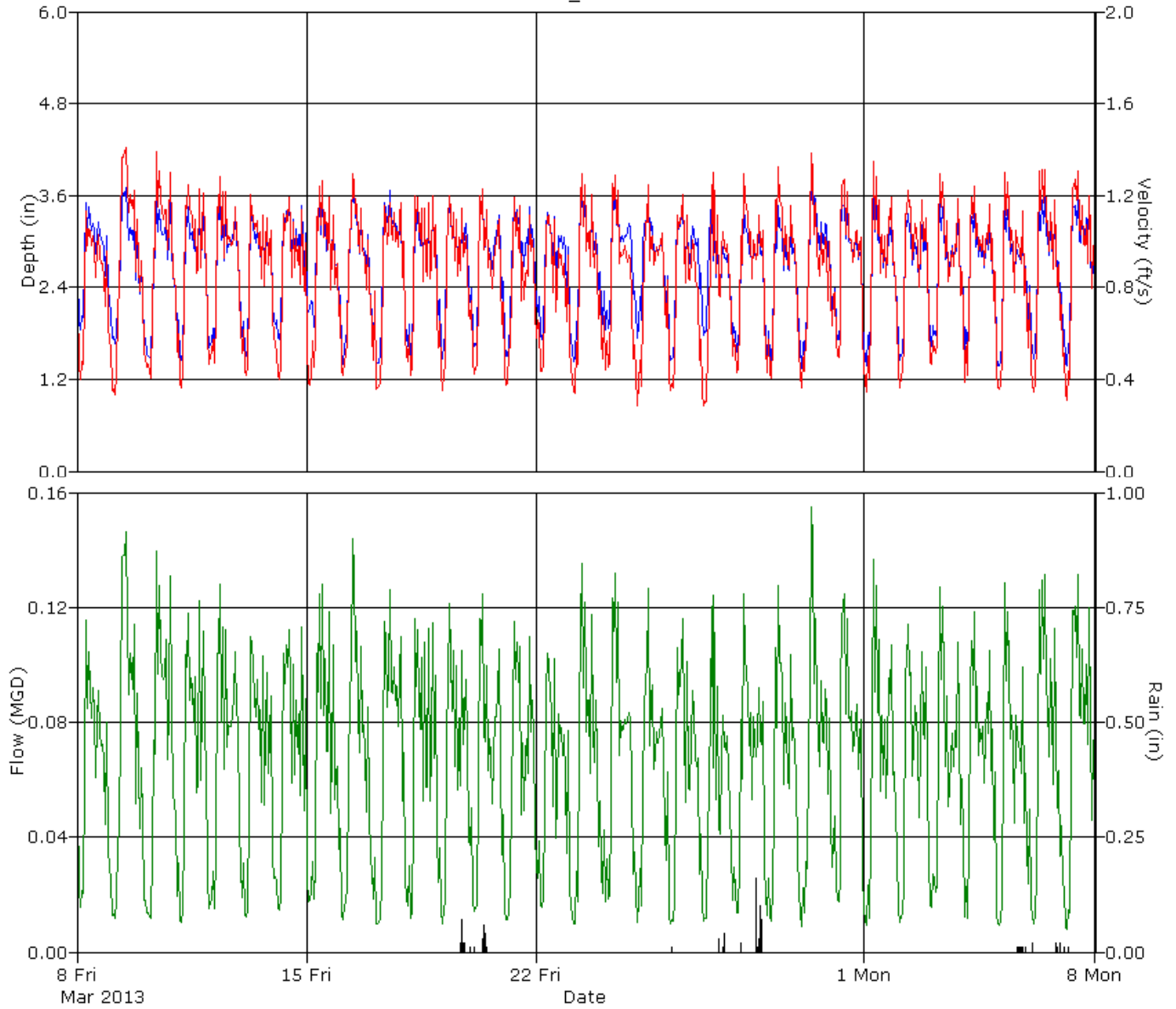
Pipe Height  
7.88 in.

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_001555	
Measured Pipe Height (in)	12
Nominal Pipe Height (in)	12
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_001555 was located in the South of Bend (see attached site report for details).

The hydrograph indicates a commercial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a fairly repeatable data set with some scatter attributed to the pump station influence. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 8%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.69	2.53	0.126
Minimum	0.75	0.58	0.008
Maximum	2.93	4.73	0.454
Time of Minimum	4/4/2013 2:55 AM	3/18/2013 3:25 AM	4/4/2013 2:55 AM
Time of Maximum	3/30/2013 11:45 AM	3/30/2013 11:45 AM	3/30/2013 11:45 AM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_001555		Monitor Series: 5000 AG		Monitor S/N: 21493	
Address/Location: 149 SW McKinley Ave		Manhole #		CMH001555	
		Coordinates:		44°02'29.62"N 121°18'36.98"W	
		Pipe Height:		12.00"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 12.00"
					IP Address: 166.219.172.55



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/26/13 @ 09:53	Manhole Depth:	~ 9'
Site Hydraulics:	Small waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	P/S	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	Small waves and slight bend	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Small waves	Telephone Information:	Doesn't apply
Depth of Flow:	2.25" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	9.75" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	4.10 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12      **Site ID:** Bend\_001555      **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/26/13

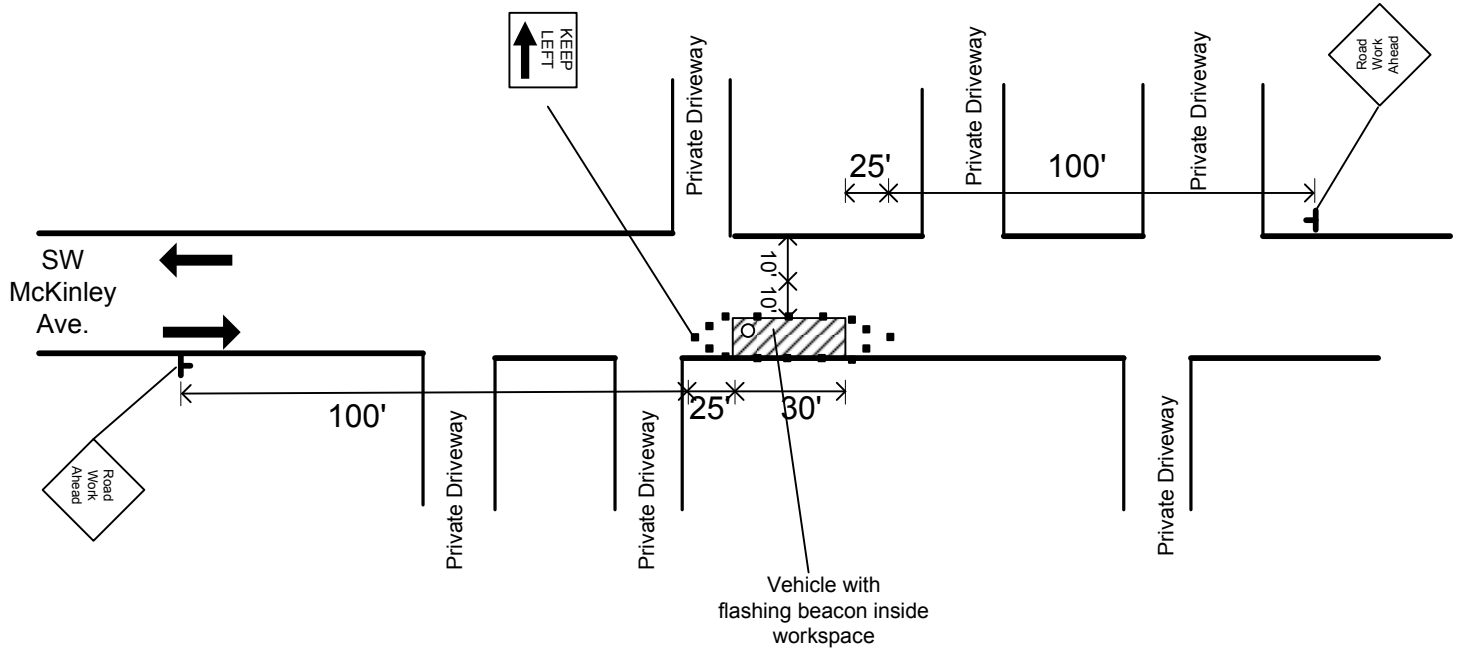
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/26/13





Posted Speed Limit

SPEED  
LIMIT  
**25**

Office (206) 762-5070  
 Fax (206) 762-5077  
 24 hour contact  
 Daniel Sinkovich  
 (206) 255-4464

**Site Access**  
 02/14/13-04/13/13  
 7:00am-4:00pm



Bend\_001555

Site location

**ADS ENVIRONMENTAL  
SERVICES®**



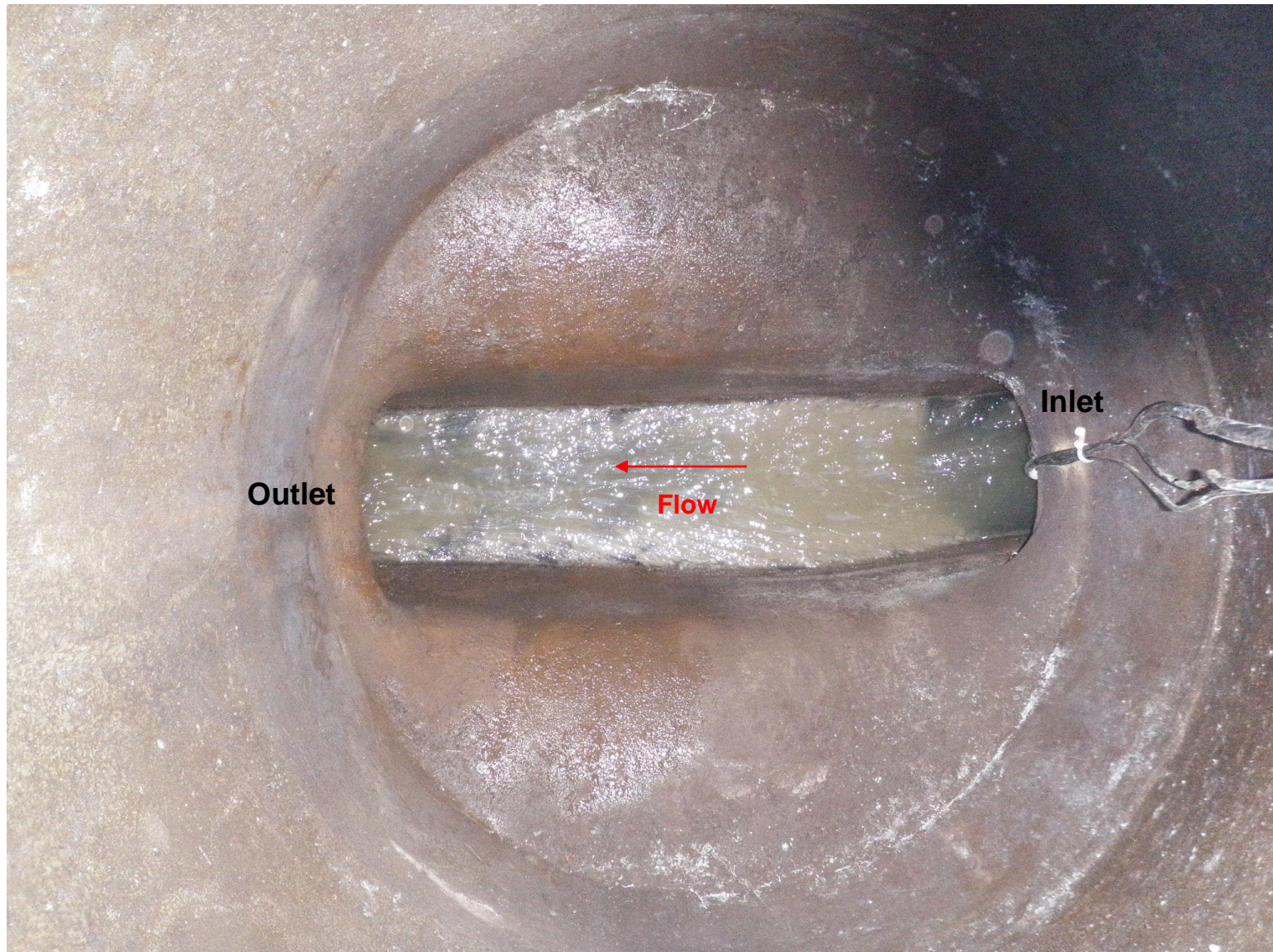
Site access looking south



Bend\_001555

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



View down manhole facing north



Bend\_001555

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of sensor placement and site hydraulics



Bend\_001555

Site outlet

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_001555

## Flow Monitor

Bend\_001555

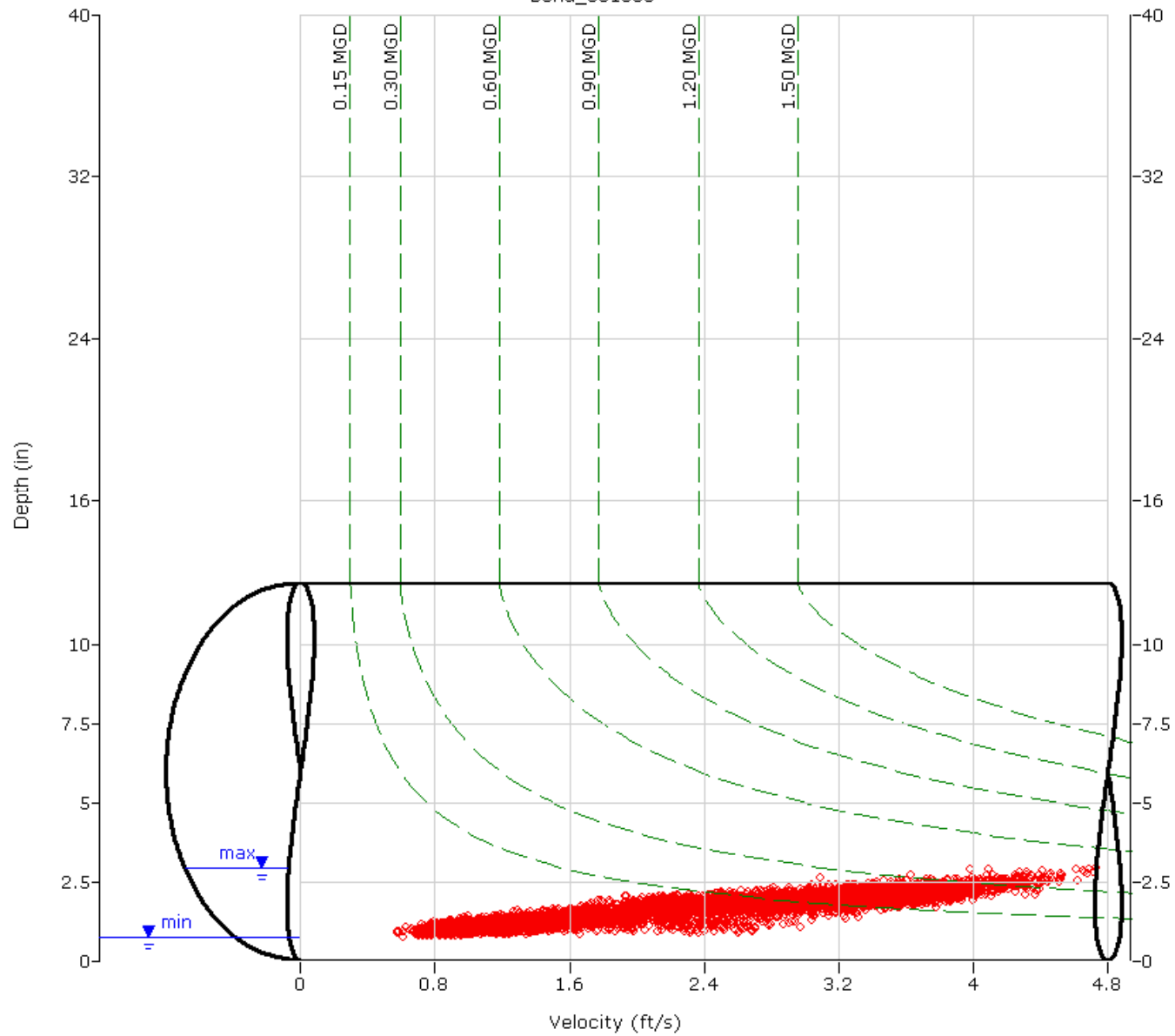
Pipe Height  
12.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_001555

## Flow Monitor

Bend\_001555

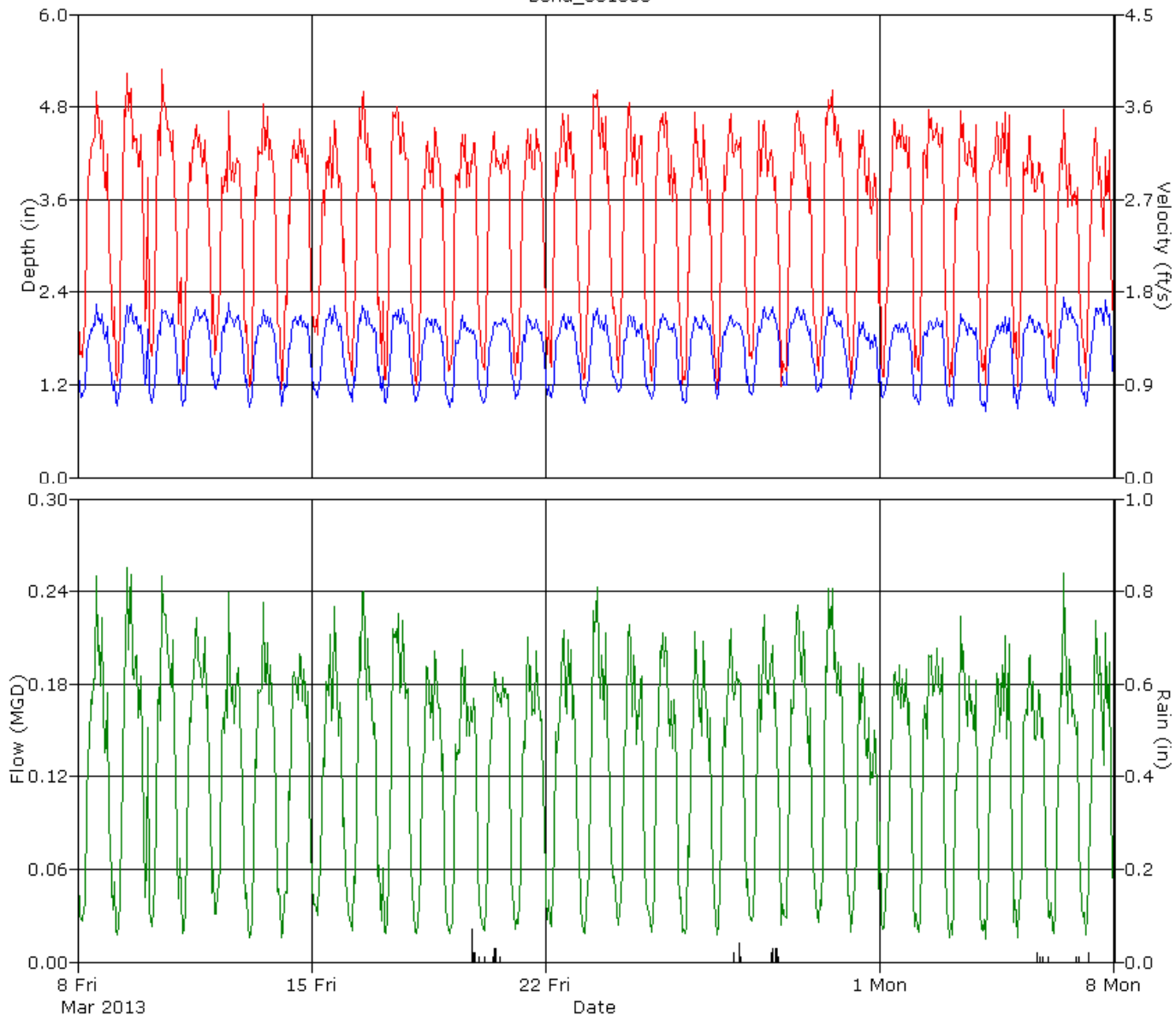
Pipe Height  
12.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_001585	
Measured Pipe Height (in)	15
Nominal Pipe Height (in)	15
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_001585 was located in the South of Bend (see attached site report for details).

The hydrograph indicates a commercial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set, however it appears that at a depth of less than 2.5" the velocity may be understated. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 8%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.81	3.92	0.746
Minimum	1.53	1.05	0.111
Maximum	7.21	5.35	2.336
Time of Minimum	3/29/2013 4:45 AM	4/3/2013 5:35 AM	3/29/2013 4:45 AM
Time of Maximum	4/7/2013 9:15 PM	3/9/2013 10:15 AM	4/7/2013 9:15 PM

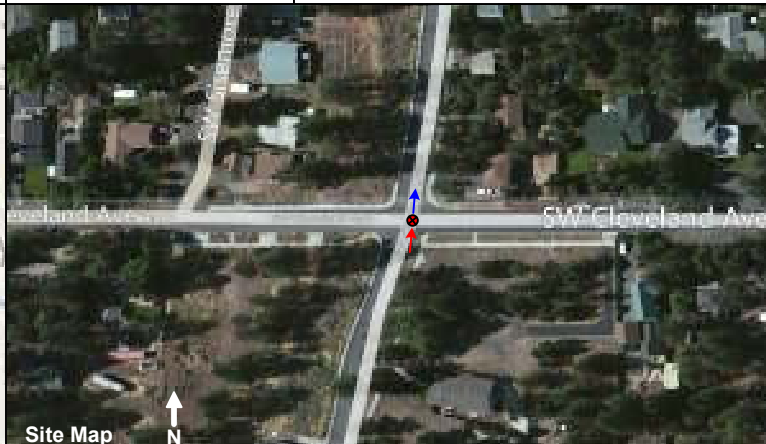
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_001585		Monitor Series: 5000 AG		Monitor S/N: 20977	
Address/Location: SW Cleveland Ave & SW Silver Lake Blvd		Manhole #		CMH001585	
		Coordinates:		44°02'26.50"N 121°18'40.52"W	
		Pipe Height:		15.00"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 15.00"
					IP Address: 166.219.172.29



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/26/13 @ 11:03	Manhole Depth:	~ 9'
Site Hydraulics:	Ripples and fast	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	Small waves and slight bend	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	Small waves	Telephone Information:	Doesn't apply
Depth of Flow:	3.87" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	11.13" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	5.08 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type: Standard		Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure		Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed		WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG		Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:	
5 PSI pressure used at this location	



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_001585 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input checked="" type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/26/13

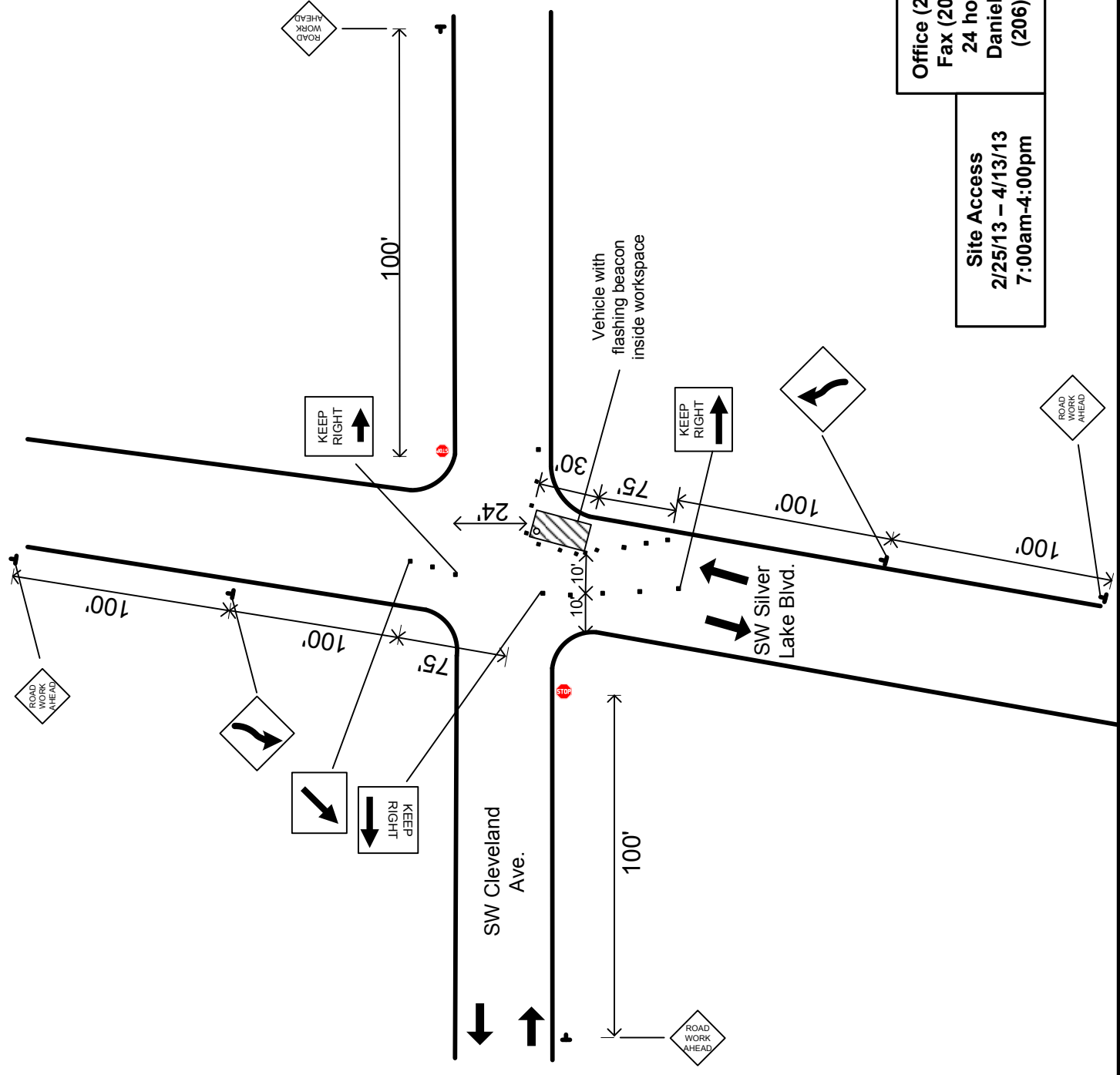
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/26/13





Posted Speed Limit  
**SPEED LIMIT 25**

**Site Access**  
2/25/13 – 4/13/13  
7:00am-4:00pm

**Office (206) 762-5070**  
**Fax (206) 762-5077**  
**24 hour contact**  
**Daniel Sinkovich**  
**(206) 255-4464**



Bend\_001585

Site location

**ADS ENVIRONMENTAL  
SERVICES®**



Site access looking north



Bend\_001585

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



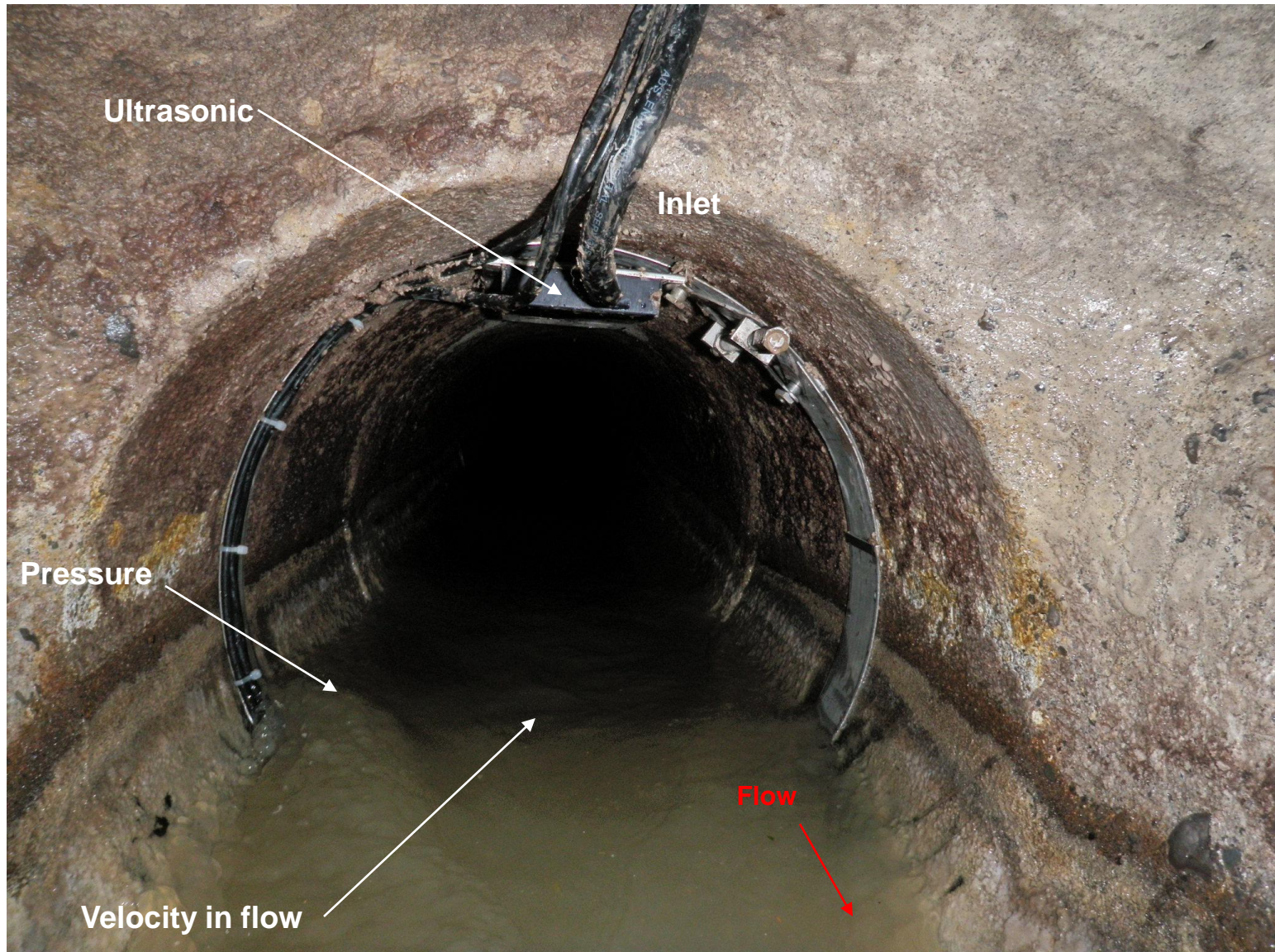
View down manhole facing north



Bend\_001585

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



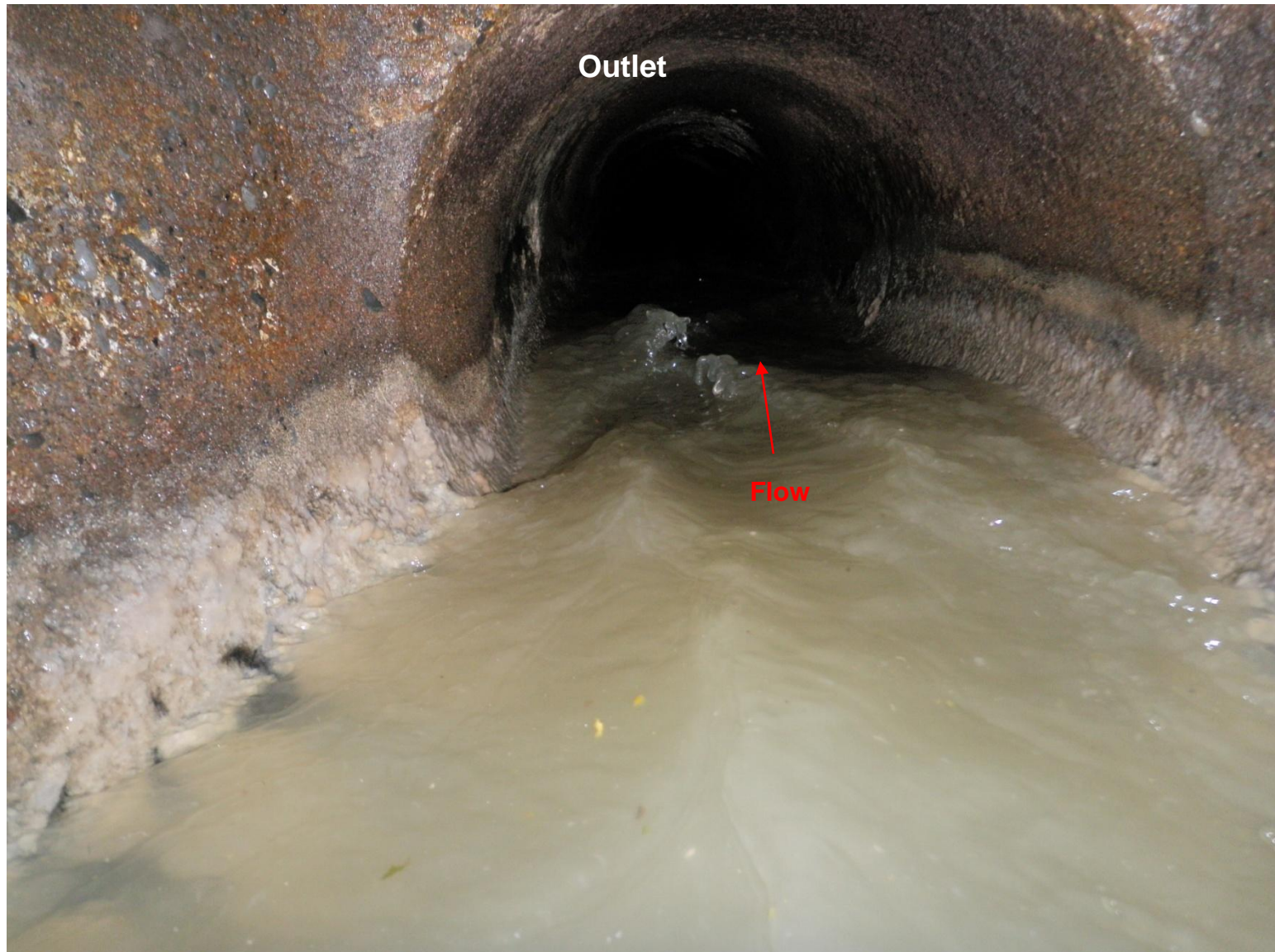
View of sensor placement and site hydraulics



Bend\_001585

Site outlet

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_001585

## Flow Monitor

Bend\_001585

Pipe Height  
15.00 in

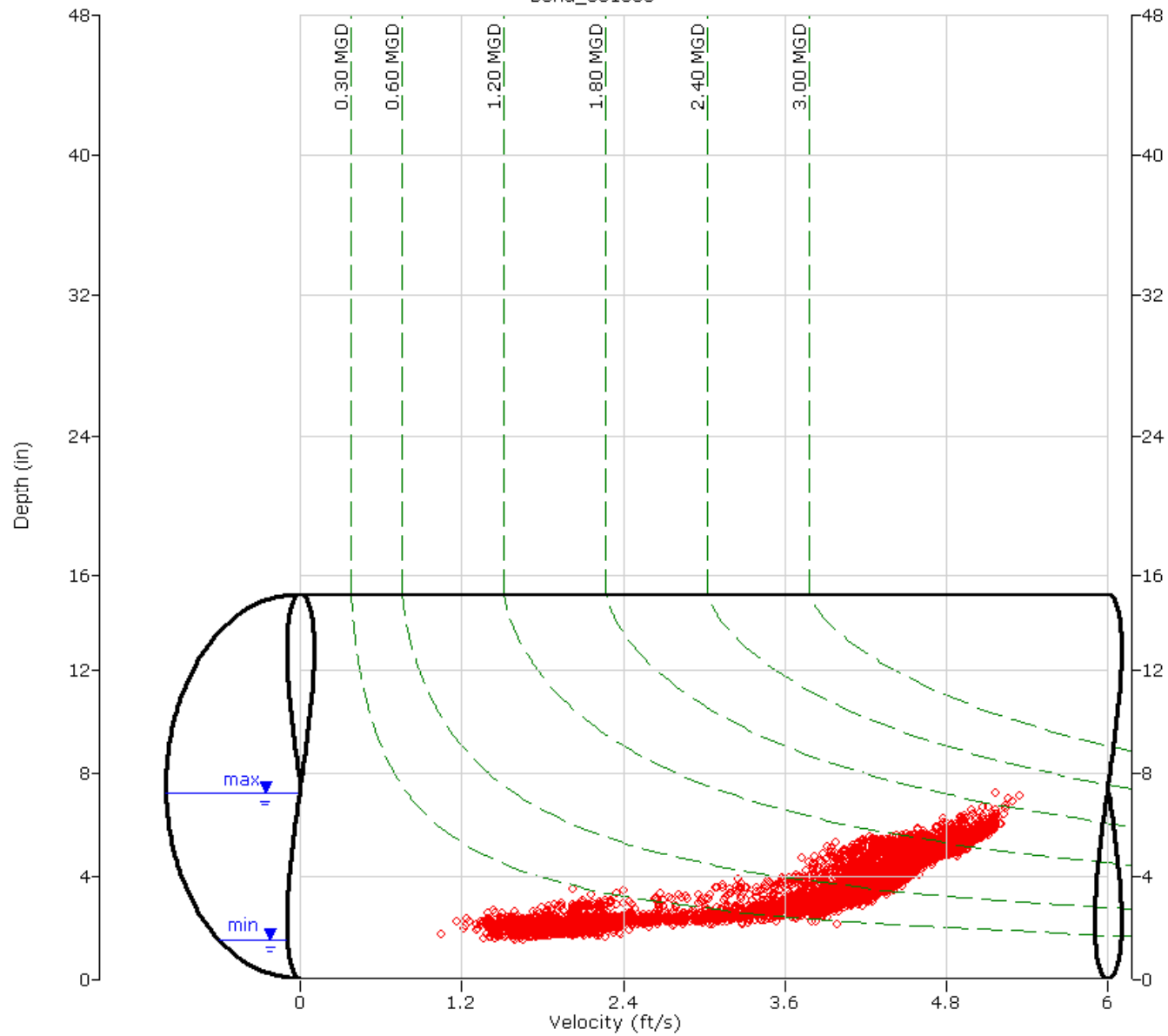
## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - Iso-Q™
- - Silt
- ▼ Min-Max Depth

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SERVICES





# HYDROGRAPH REPORT

Bend\_001585

## Flow Monitor

Bend\_001585

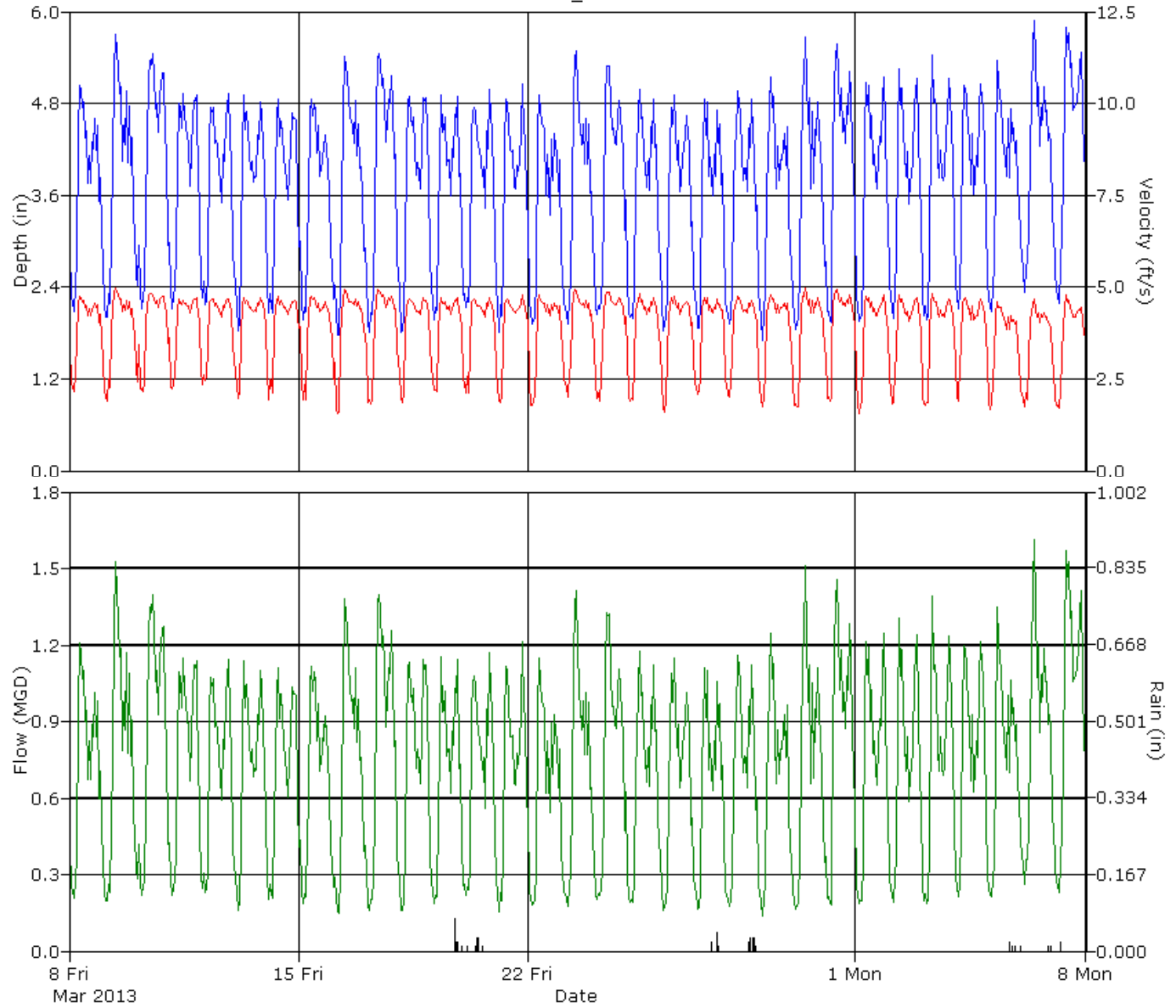
Pipe Height  
15.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_001587	
Measured Pipe Height (in)	24
Nominal Pipe Height (in)	24
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_001587 was located in the South of Bend (see attached site report for details). Originally this site was to be monitored at CMH001579, but that location had a hydraulic jump at peak flow conditions. The data for this location begins on March 26, 2013.

The hydrograph indicates a commercial diurnal flow pattern with a lift station influence during the period Tuesday, March 26, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set, with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Tuesday, March 26, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	6.08	2.58	1.109
Minimum	2.97	1.48	0.212
Maximum	8.95	3.47	2.359
Time of Minimum	4/3/2013 3:45 AM	4/3/2013 3:45 AM	4/3/2013 3:45 AM
Time of Maximum	3/31/2013 11:45 AM	3/30/2013 11:40 AM	3/31/2013 11:45 AM

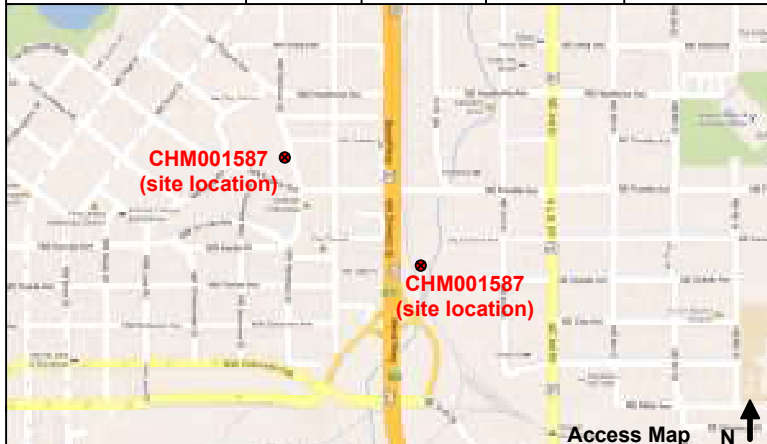
### Data Quality

The data uptime for the Tuesday, March 26, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Originally this site was to be monitored at CMH001579, but that location had a hydraulic jump at peak flow conditions. The data for this location begins on March 26, 2013. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: SW	
Site Name: Bend_001587		Monitor Series: 5000 AG		Monitor S/N: 21484	
Address/Location: 105 Northeast Franklin Avenue in Southwest parking lot near railroad tracks		Manhole #		CMH001587	
		Coordinates:		44°03'15.43"N 121°18'22.26"W	
		Pipe Height:		24.00"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 23.88"
					IP Address: 166.219.172.33



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	3/26/13 @ 09:50	Manhole Depth:	~ 8'
Site Hydraulics:	Small waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	Waves and slight bend	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	Small waves	Telephone Information:	Doesn't apply
Depth of Flow:	7.00" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	17.00" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	2.58 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Pipe 24.00" X 23.88" diameter.</p> <p>M.H. ~ 8 ft. deep</p> <p>N →</p> <p>Cross Section</p>	<p>Ultrasonic, velocity, and pressure sensors location</p> <p>Flow</p> <p>N ↑</p> <p>Planar</p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_001587 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

<input checked="" type="checkbox"/>	This worksite does NOT require a traffic control Plan
<input type="checkbox"/>	Standard Traffic Control Plan is to be used at this work site
<input type="checkbox"/>	This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Sean Winder  
 Signature: Signed copy can be obtained from ADS  
 Date: 3/26/13

#### Reviewed

Project Mgr Name: Mike Pina  
 Signature: Signed copy can be obtained from ADS  
 Date: 3/26/13



Bend\_001587  
Site Access

**ADS ENVIRONMENTAL  
SERVICES®**



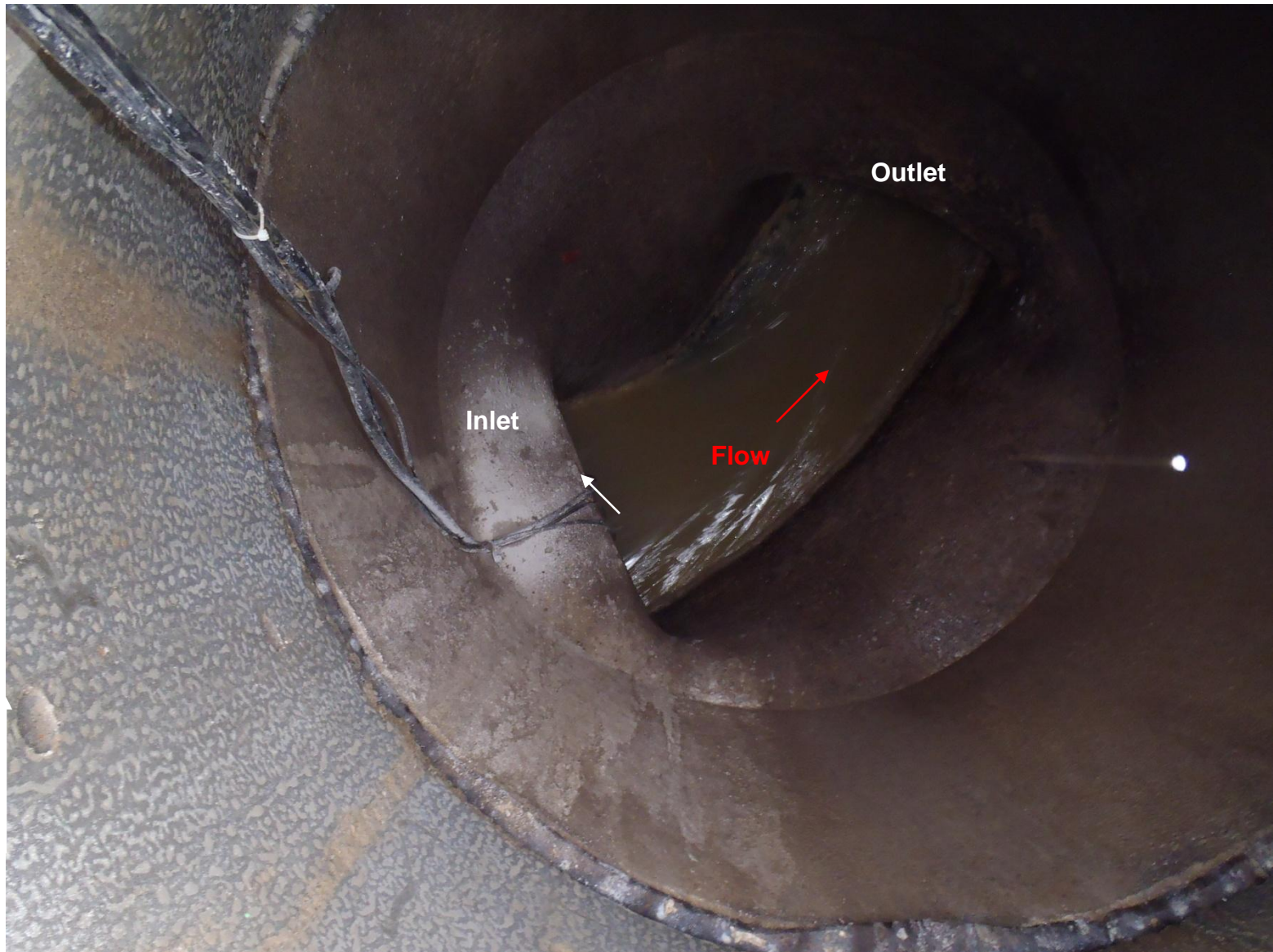
Site access looking northeast



Bend\_001587

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



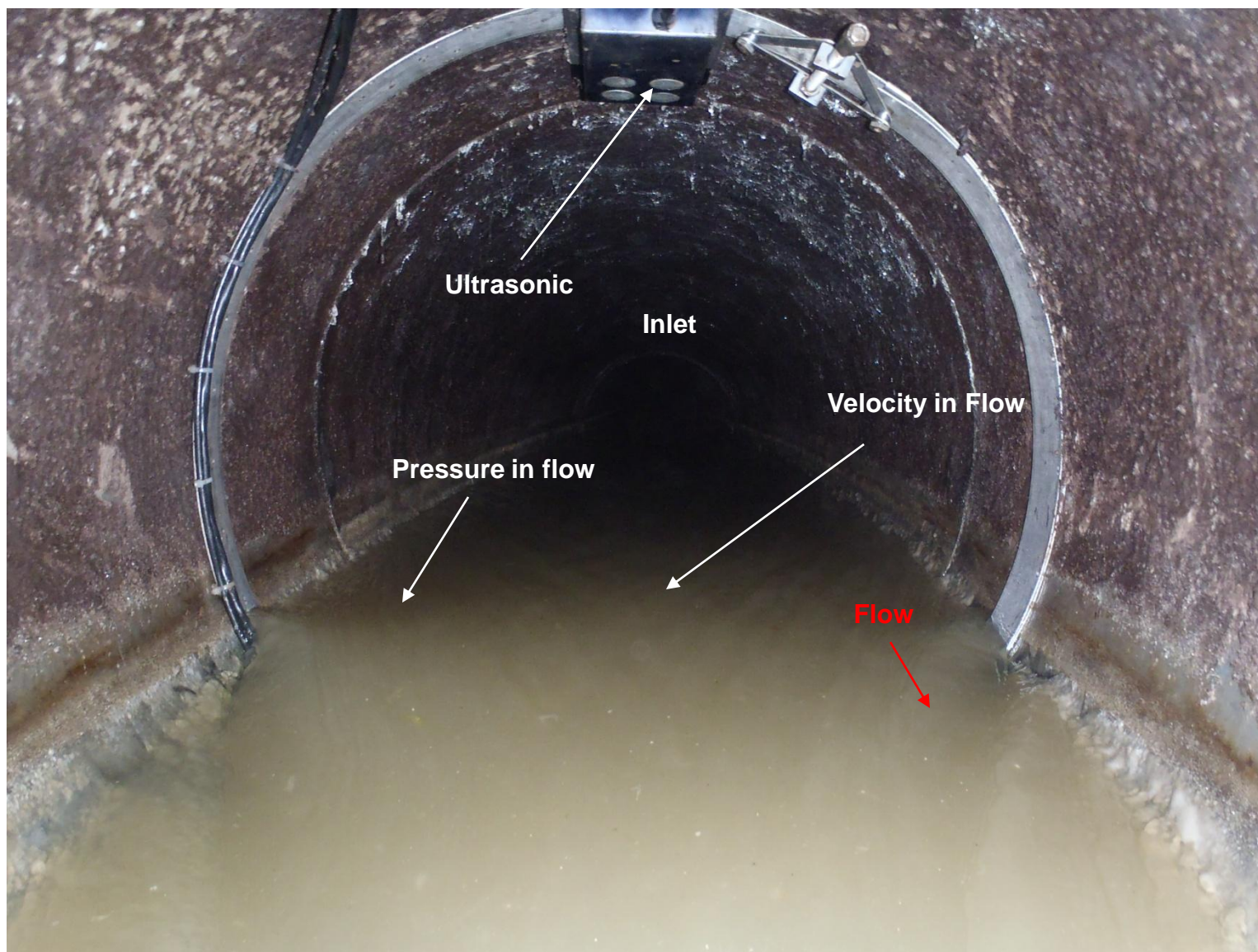
View of site looking north



Bend\_001587

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of inlet and sensors



Bend\_001587

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



Flow

View of outlet



# SCATTERGRAPH REPORT

Bend\_001587

## Flow Monitor

Bend\_001587

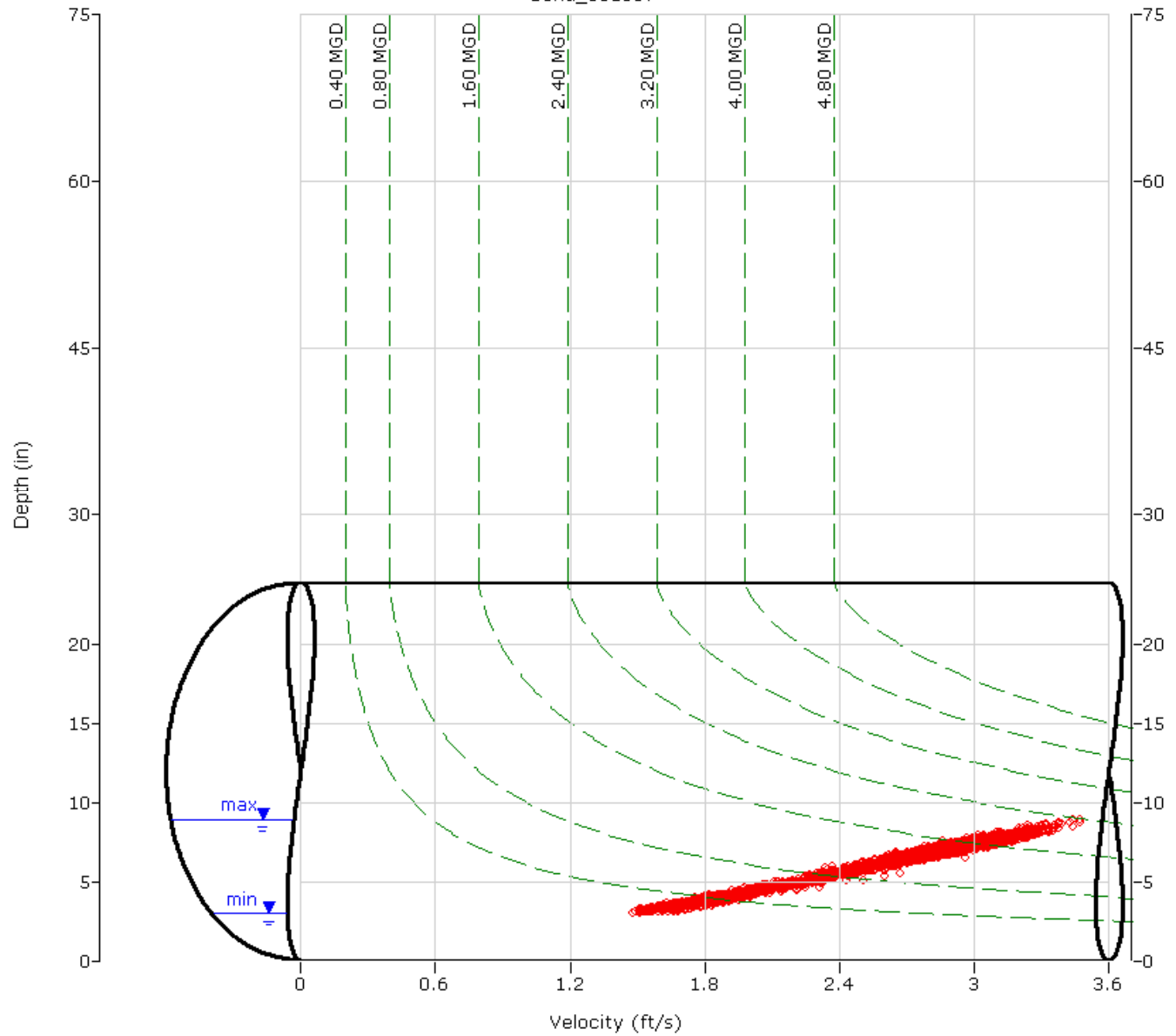
Pipe Height  
24.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_001587

## Flow Monitor

Bend\_001587

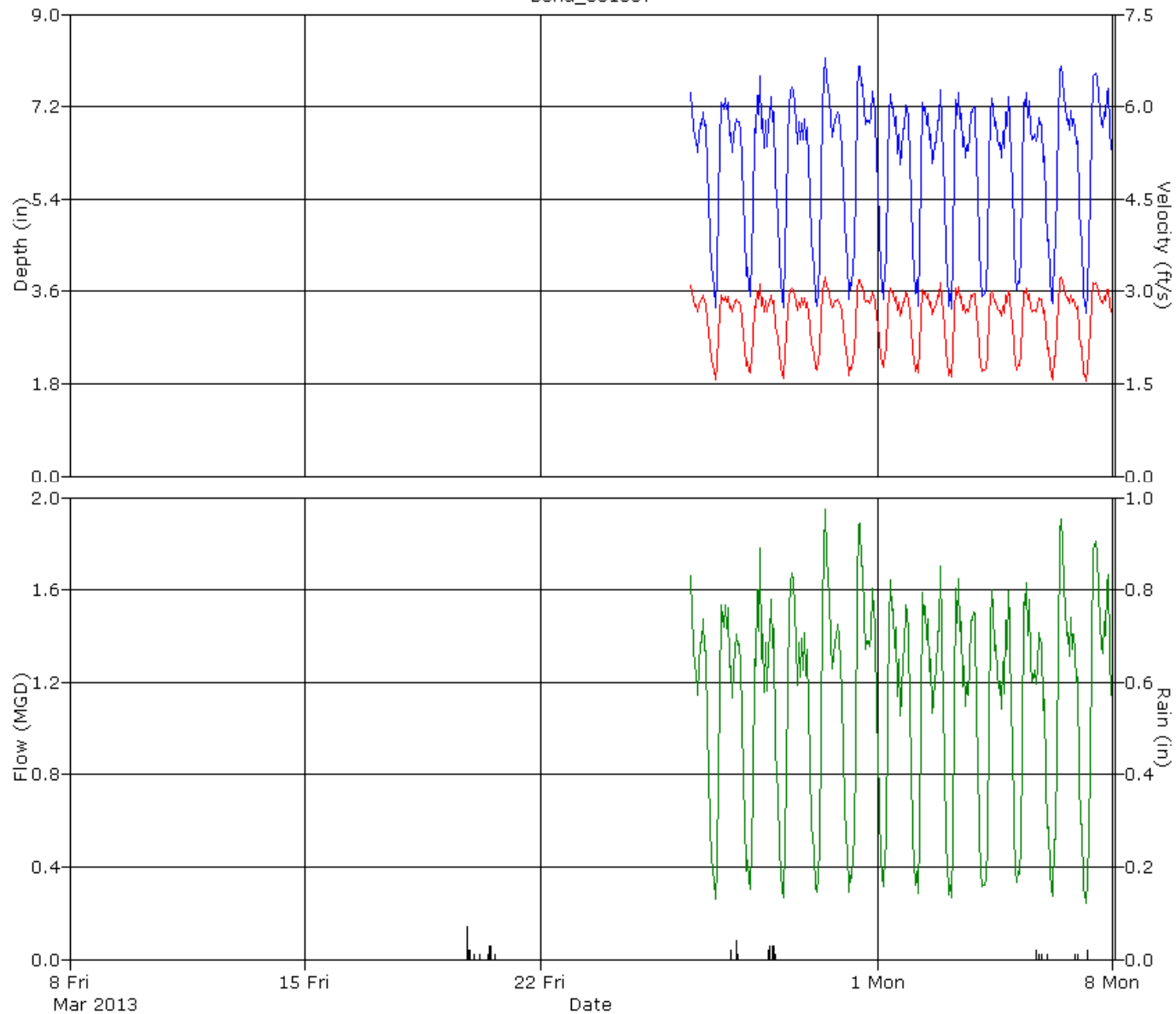
Pipe Height  
24.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

---

### Site Information

Bend_001732	
Measured Pipe Height (in)	14.5
Nominal Pipe Height (in)	15
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_001732 was located in the Northeast of Bend (see attached site report for details).

The hydrograph indicates a commercial/industrial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a fairly repeatable data set with some scatter attributed to the pump station influence. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 8%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.97	0.93	0.067
Minimum	0.97	0.24	0.008
Maximum	4.30	2.04	0.358
Time of Minimum	3/14/2013 1:10 AM	3/18/2013 12:05 AM	3/10/2013 5:15 AM
Time of Maximum	4/1/2013 11:30 AM	3/13/2013 1:55 PM	4/2/2013 10:55 AM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100

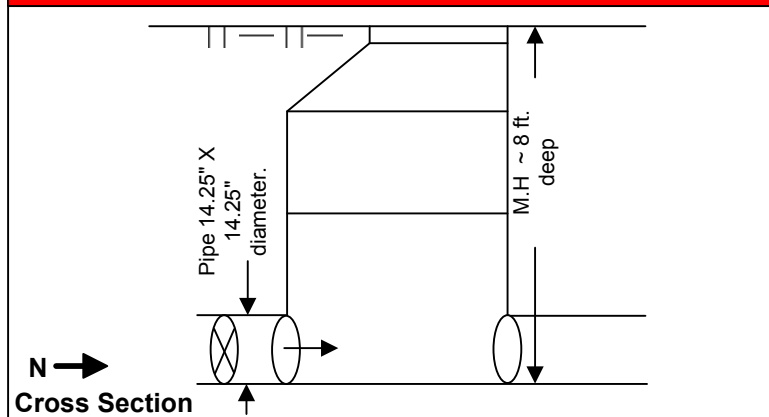


Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_001732		Monitor Series: 5000 AG		Monitor S/N: 20968	
Address/Location: 63064 NE 18 <sup>th</sup> St.		Manhole #		CMH001732	
		Coordinates:		44°05'22.61" N, 121°16'52.27" W	
		Pipe Height:		14.50"	
Access: Drive		Type of System:		Pipe Width: 14.50"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.172.41	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/22/2013 @ 10:30	Manhole Depth:	~ 8'
Site Hydraulics:	Ripples	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	2.75" +/- .25"	Access Pole #:	Doesn't apply
Range (Air DOF):	12.00" +/- .25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.50 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

### Other Information:



Installation Information		Backup	Yes	No	?	Distance
Installation Type:	Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height:	None Observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	JRRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

### Additional Site Information / Comments:



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_001732 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/22/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/22/13





Empire Ave.

63085

Road  
Work  
Ahead

225'

STEWART

63088

Center Lane  
Closed  
Ahead

175'

Vehicle  
with  
flashing  
beacon  
inside  
workspace



100'

63076

63064

50'

125'



Montana  
Way

150'

100'



Road  
Work  
Ahead

Bicycles  
on  
Roadway

350'

Center Lane  
Closed  
Ahead

Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

Site Access  
2/14/13-4/13/13  
7:00am-4:00pm



NE 18<sup>th</sup>  
St.

350'

Road  
Work  
Ahead



Bend\_001732

Site location

**ADS ENVIRONMENTAL  
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Site access

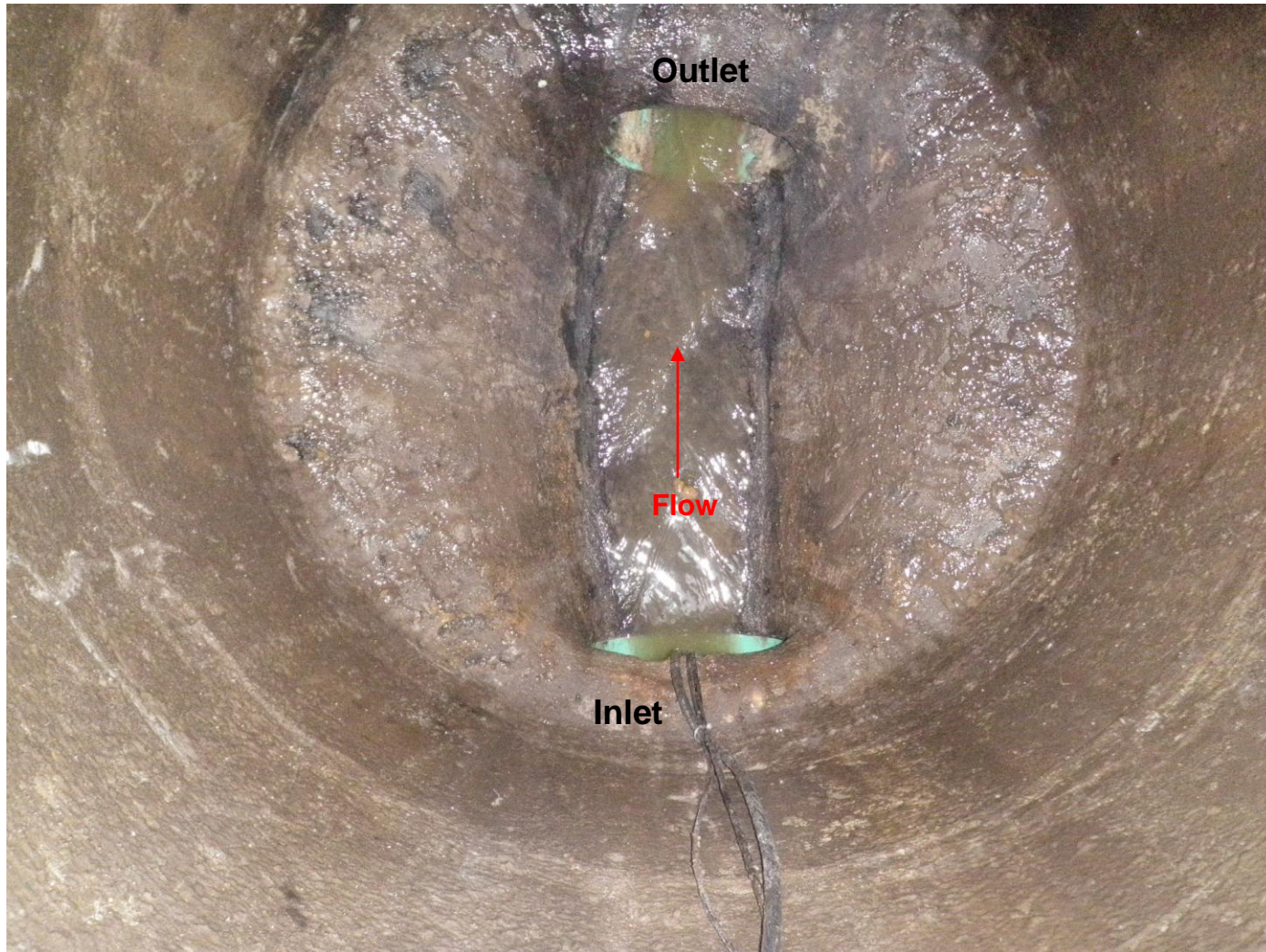
Site access looking north



Bend\_001732

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



View down manhole facing north



Bend\_001732

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of sensor placement and site hydraulics



Bend\_001732

Site outlet

**ADS ENVIRONMENTAL  
SERVICES®**



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_001732

## Flow Monitor

Bend\_001732

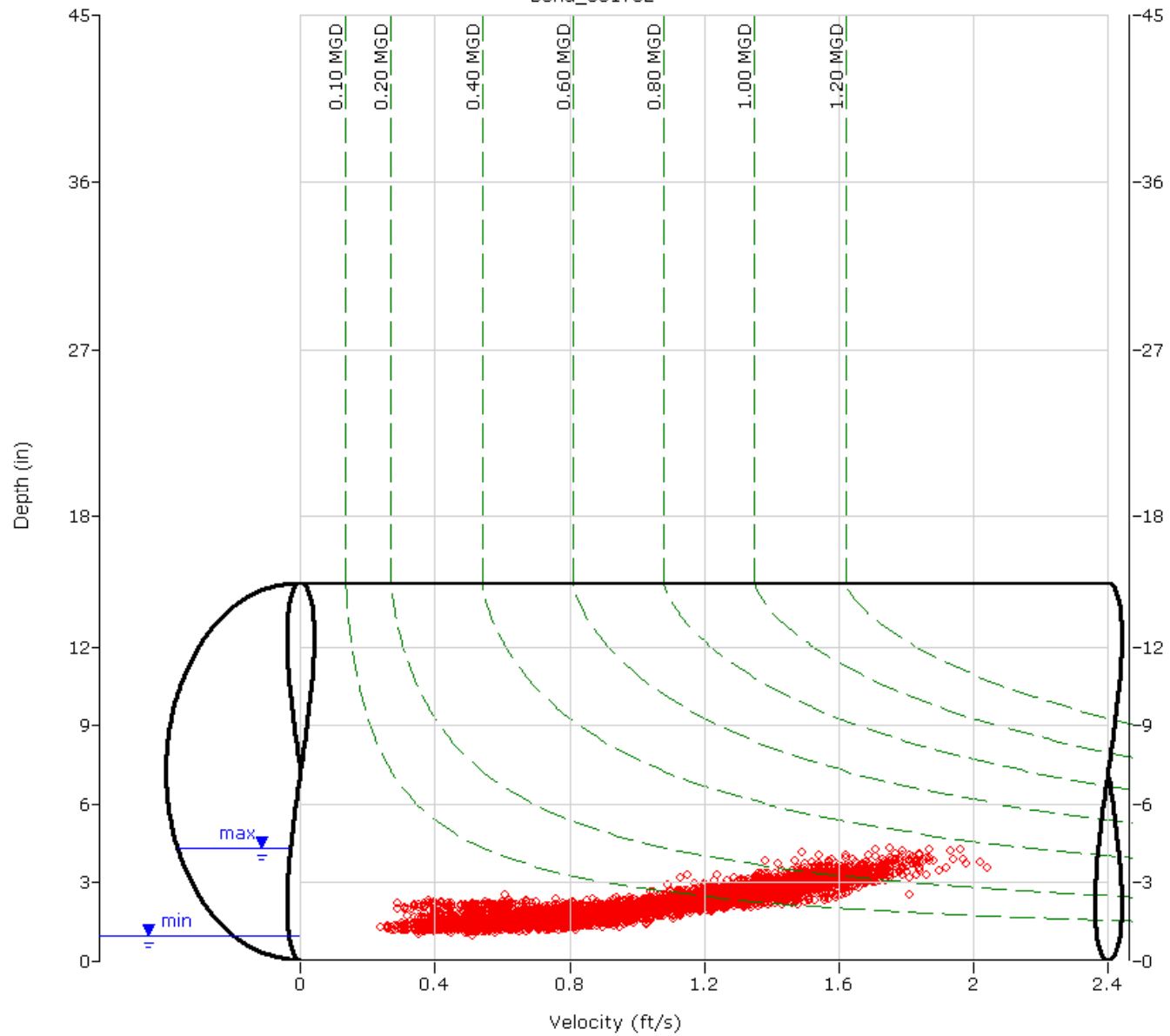
Pipe Height  
14.50 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_001732

## Flow Monitor

Bend\_001732

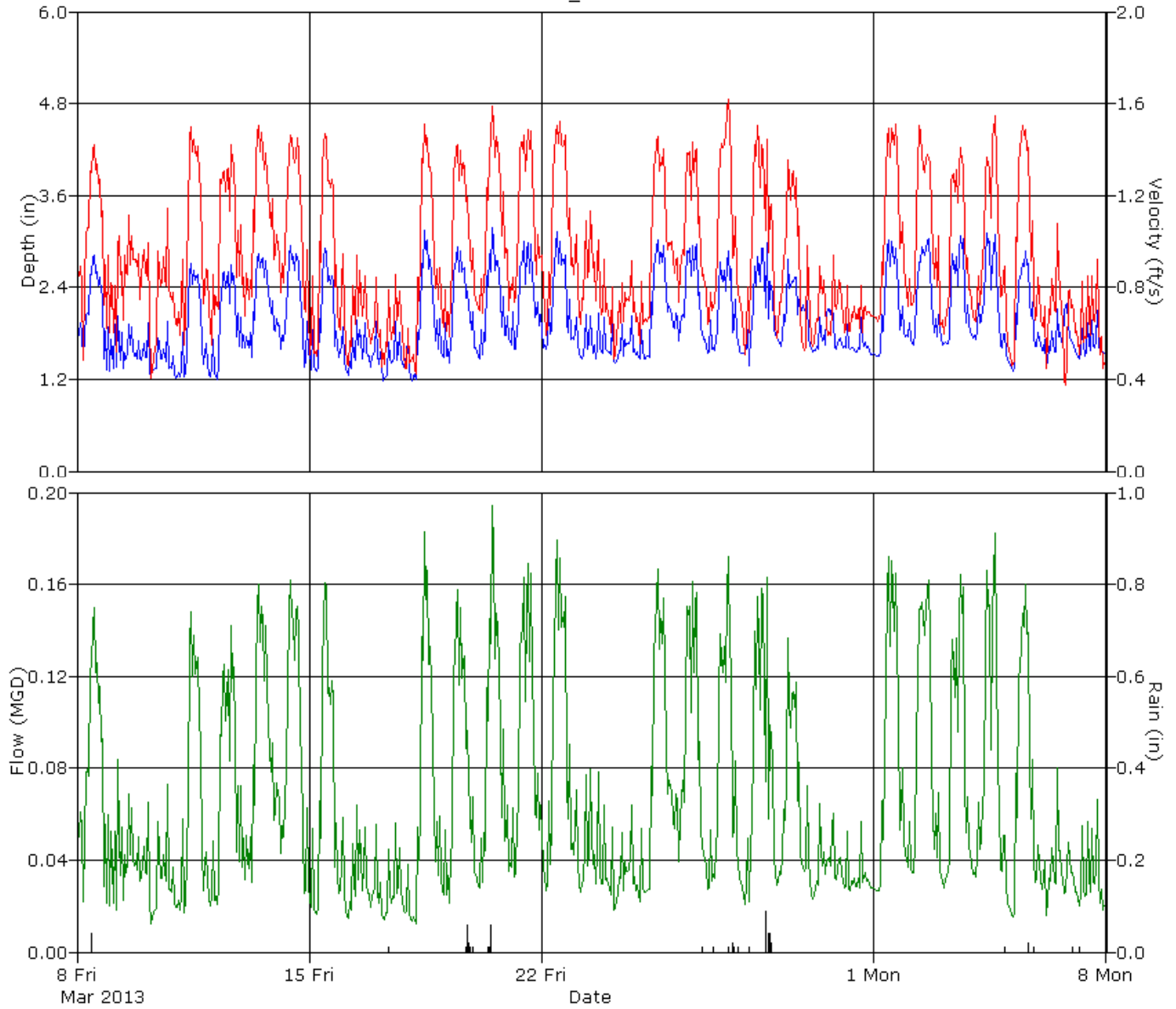
Pipe Height  
14.50 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_001800	
Measured Pipe Height (in)	14.5
Nominal Pipe Height (in)	15
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_001800 was located in the Southwest of Bend (see attached site report for details).

The hydrograph indicates a commercial diurnal flow pattern with a significant lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set, with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.82	1.55	0.270
Minimum	1.44	0.26	0.014
Maximum	7.00	2.94	1.015
Time of Minimum	3/22/2013 5:00 AM	3/13/2013 2:45 AM	3/9/2013 3:35 AM
Time of Maximum	3/10/2013 8:40 PM	3/15/2013 7:40 AM	3/17/2013 9:30 AM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: SW	
Site Name: Bend_001800		Monitor Series: 5000 AG		Monitor S/N: 20662	
Address/Location: In easement on west side of the Bend Pkwy and HWY 97 (SE 3 <sup>rd</sup> St.) intersection				Manhole #: CMH001800	
				Coordinates: 44° 0'58.41"N 121° 19'9.75"W	
				Pipe Height: 14.50"	
Access: Drive		Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>
				Pipe Width: 14.25"	
				IP Address: 166.219.172.62	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/21/13 @ 4:39	Manhole Depth:	~ 5
Site Hydraulics:	Smooth, drawdown	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	L/S	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	90 degree bend, standing wave	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	3.75" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	10.75" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.72 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Cross Section</p>	<p>Planar</p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_SGRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
---



### Flow Monitoring Site Safety Plan

**Project Name:** Bend .TFM.OR.12 **Site ID:** Bend\_001800 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site has no usable rungs. Manhole access by tripod only.

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☒ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Sean Winder

Signature: Signed copy can be obtained from ADS

Date: 2/26/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/26/13



Bend\_001800

Site location

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Site access

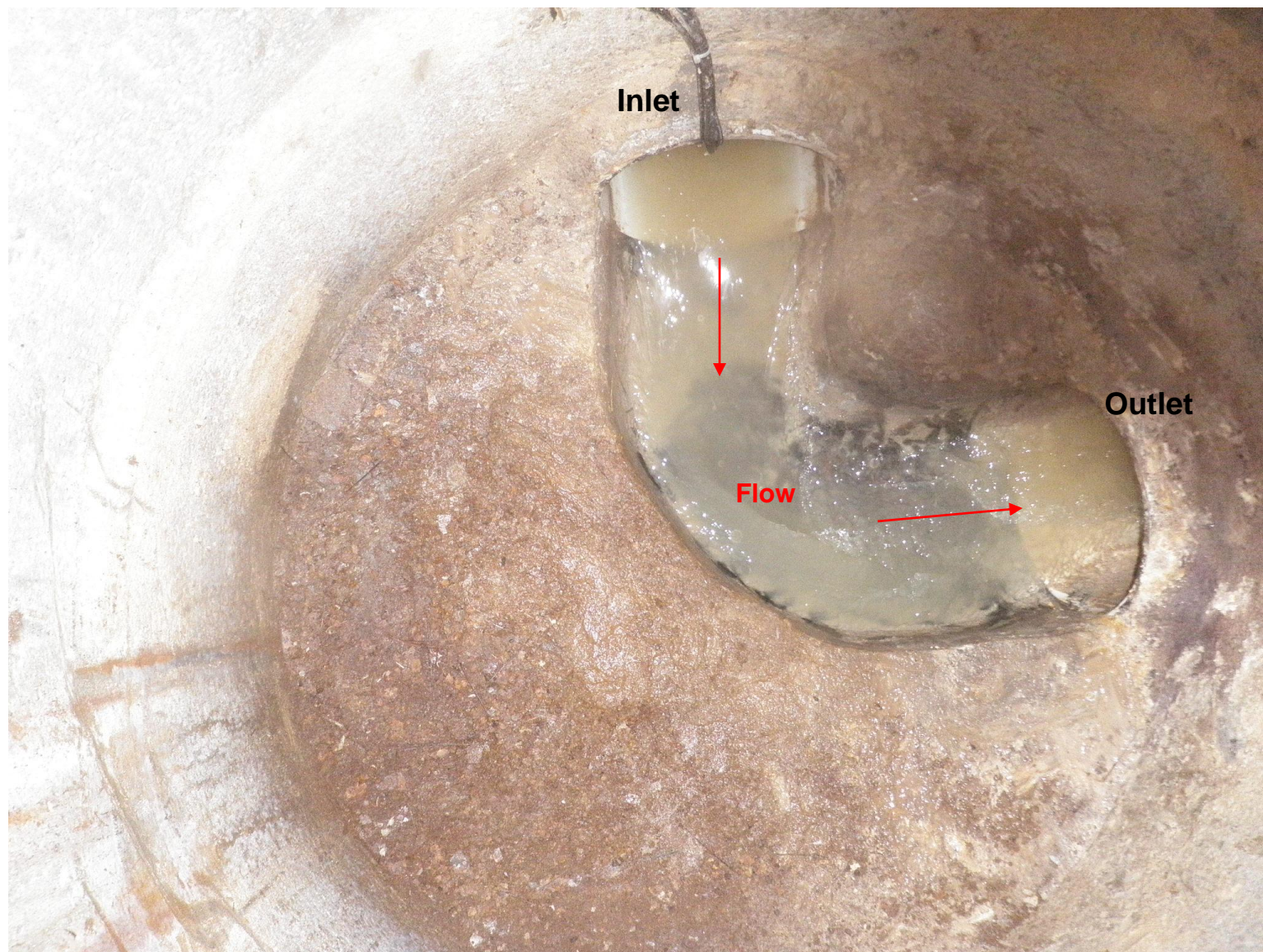
Site access looking northeast



Bend\_001800

Site set up

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SERVICES®



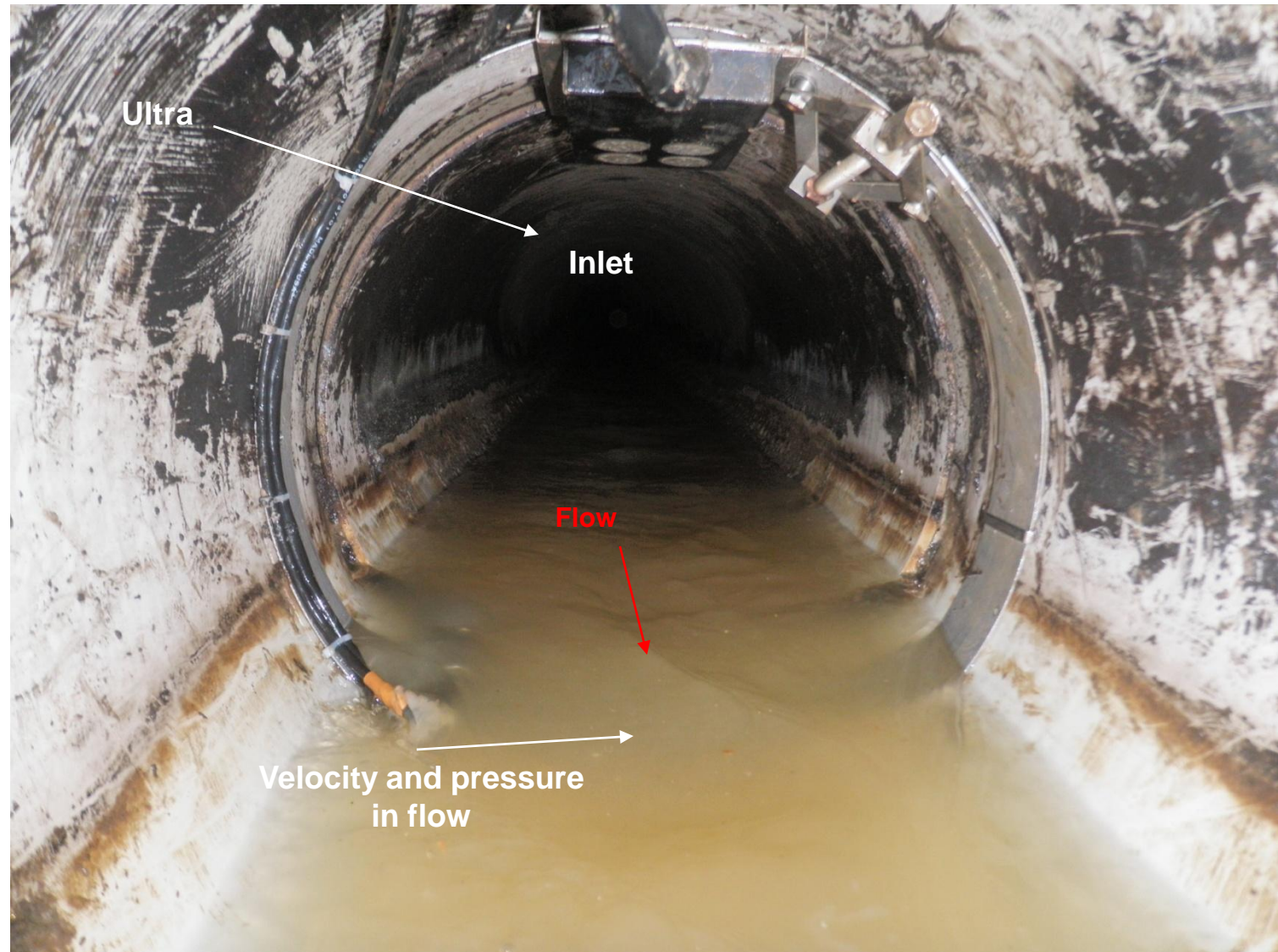
View down manhole facing north



Bend\_001800

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



**View of sensor placement and site hydraulics**



Bend\_001800

Site outlet

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_001800

## Flow Monitor

Bend\_001800

Pipe Height  
14.50 in

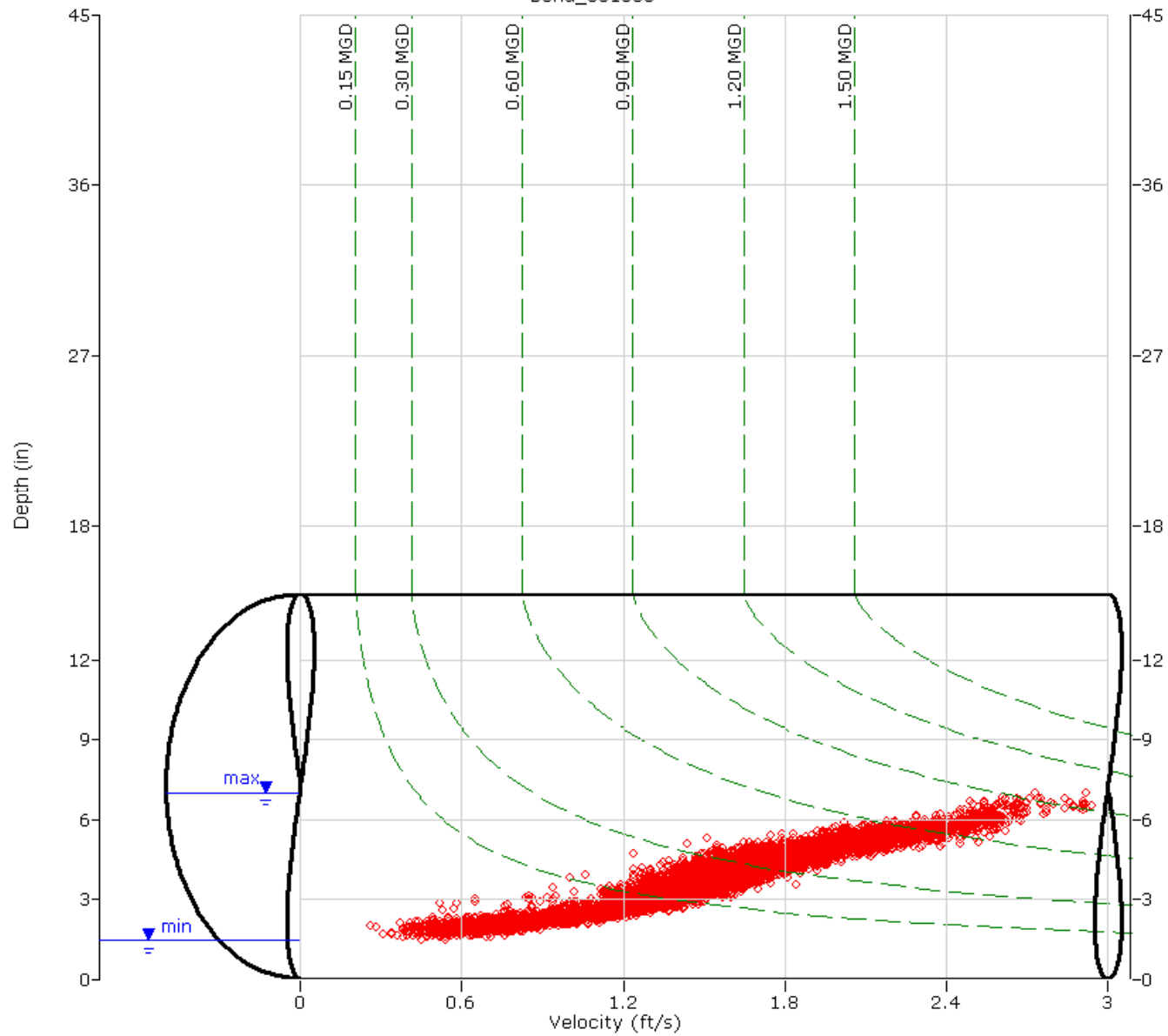
## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - Iso-Q™
- - Silt
- ▼ Min-Max Depth

AGS ENVIRONMENTAL  
SERVICES





# HYDROGRAPH REPORT

Bend\_001800

## Flow Monitor

Bend\_001800

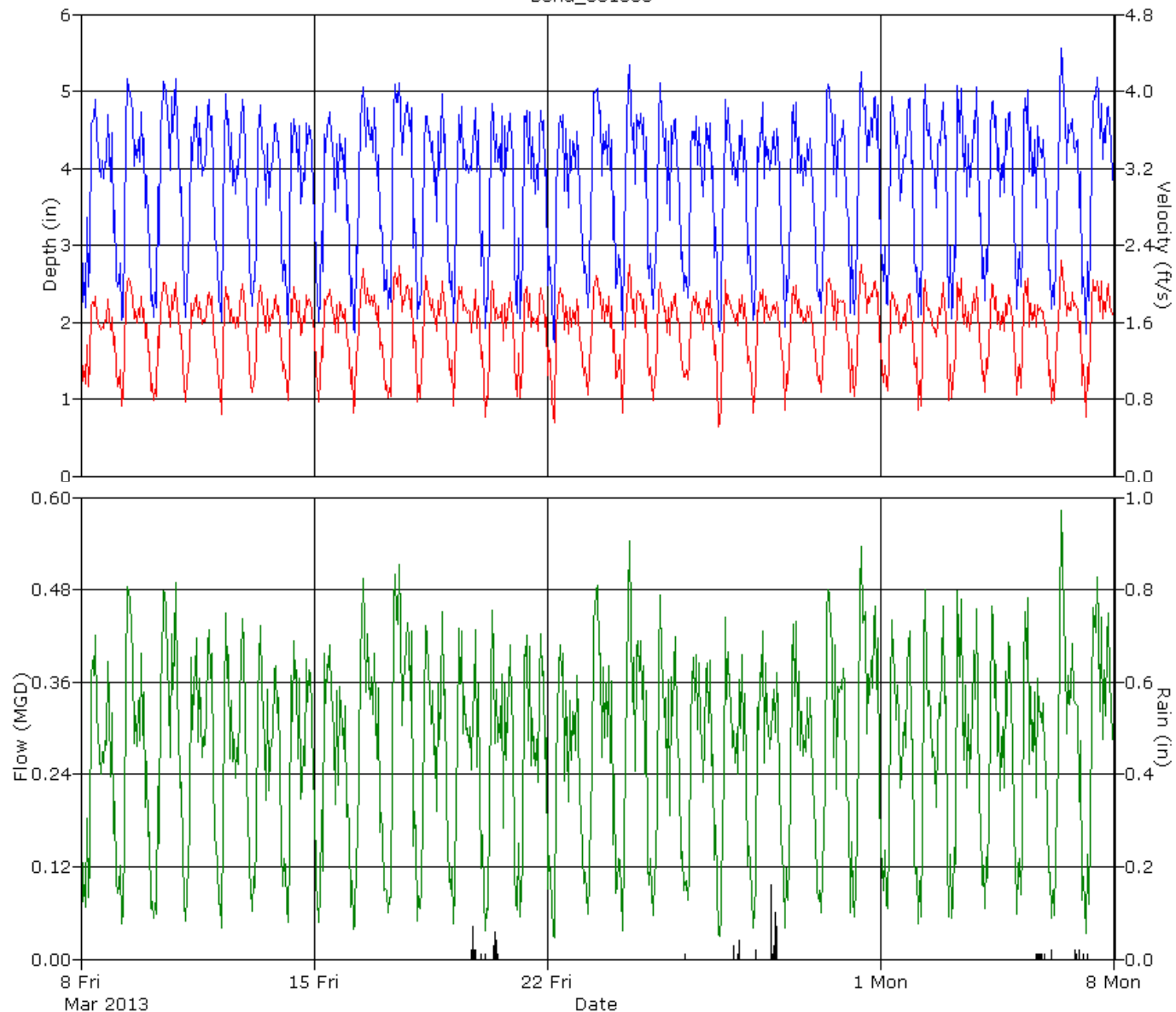
Pipe Height  
14.50 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_002069	
Measured Pipe Height (in)	16.38
Nominal Pipe Height (in)	16
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_002069 was located in the East of Bend (see attached site report for details).

The hydrograph indicates a commercial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set, with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.76	4.27	0.767
Minimum	1.89	1.77	0.108
Maximum	6.21	6.59	2.042
Time of Minimum	4/6/2013 4:10 AM	4/6/2013 4:10 AM	4/6/2013 4:10 AM
Time of Maximum	4/7/2013 11:05 AM	3/16/2013 11:15 AM	4/7/2013 11:05 AM

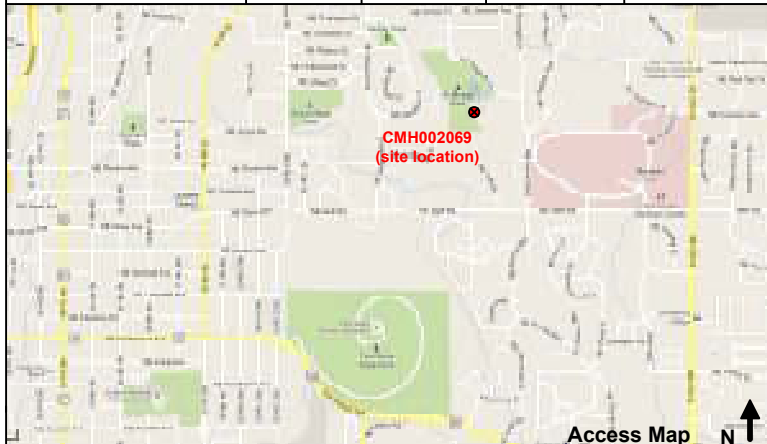
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_002069		Monitor Series: 5000 AG		Monitor S/N: 21019	
Address/Location: On easement behind school off of Dagger Rd.		Manhole #		CMH002069	
		Coordinates:		44° 4'11.15"N 121°16'37.90"W	
		Pipe Height:		16.38"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 16.38"
					IP Address: 166.219.172.56



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/27/2013 @ 15:35	Manhole Depth:	~ 9'
Site Hydraulics:	Small waves, fast	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	Not influenced	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	Waves, slight bend in line with side inlet	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	Small waves	Telephone Information:	Doesn't apply
Depth of Flow:	4.25" +/- 0.38"	Access Pole #:	Doesn't apply
Range (Air DOF):	12.13" +/- 0.38"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	5.90 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Cross Section</p>	<p>Planar</p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_002069 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☒ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/27/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/27/13



Bend\_002069

Site location

**ADS ENVIRONMENTAL  
SERVICES®**



Site access

Site access looking northeast



Bend\_002069

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



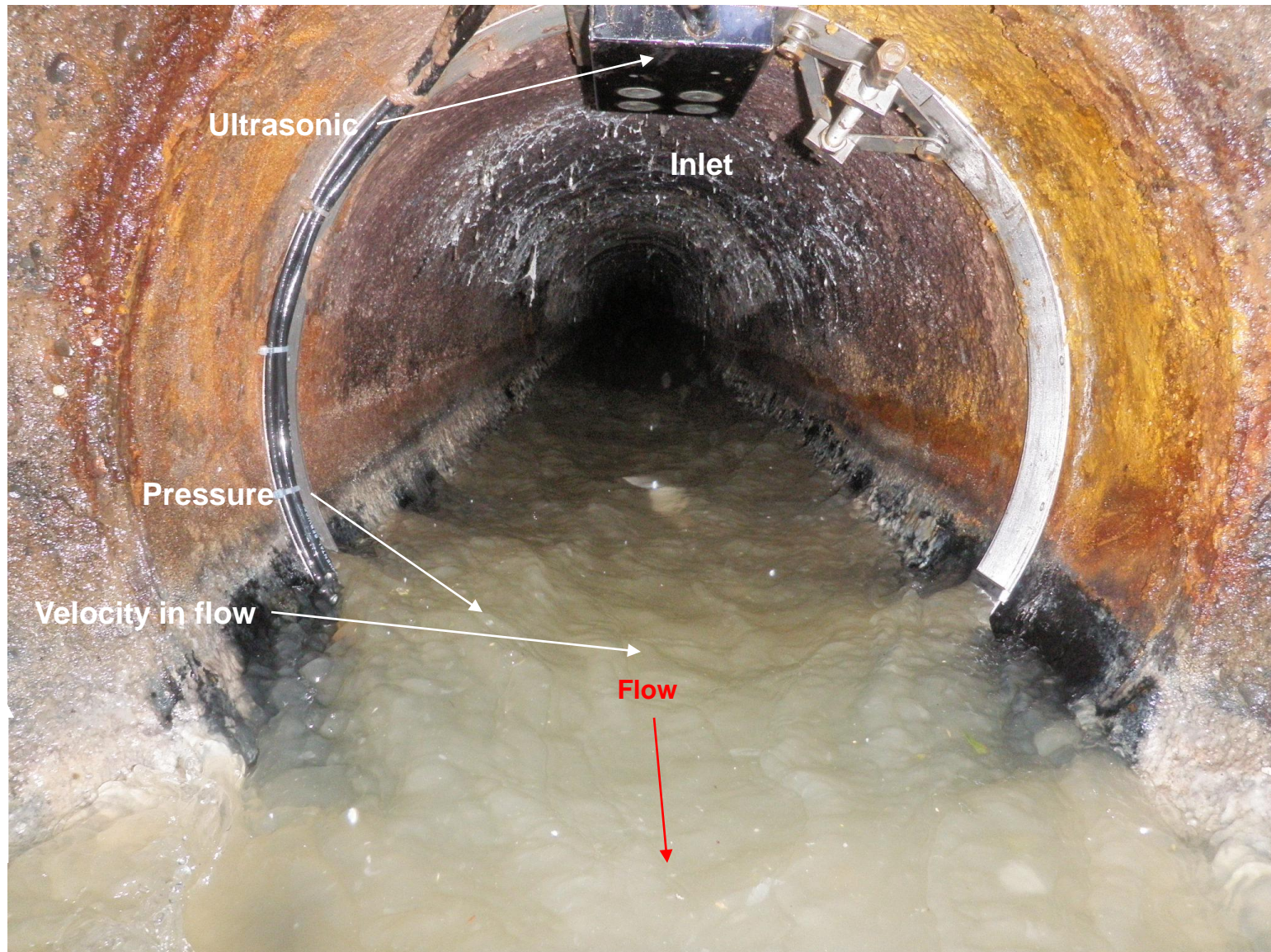
View down manhole facing northeast



Bend\_002069

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



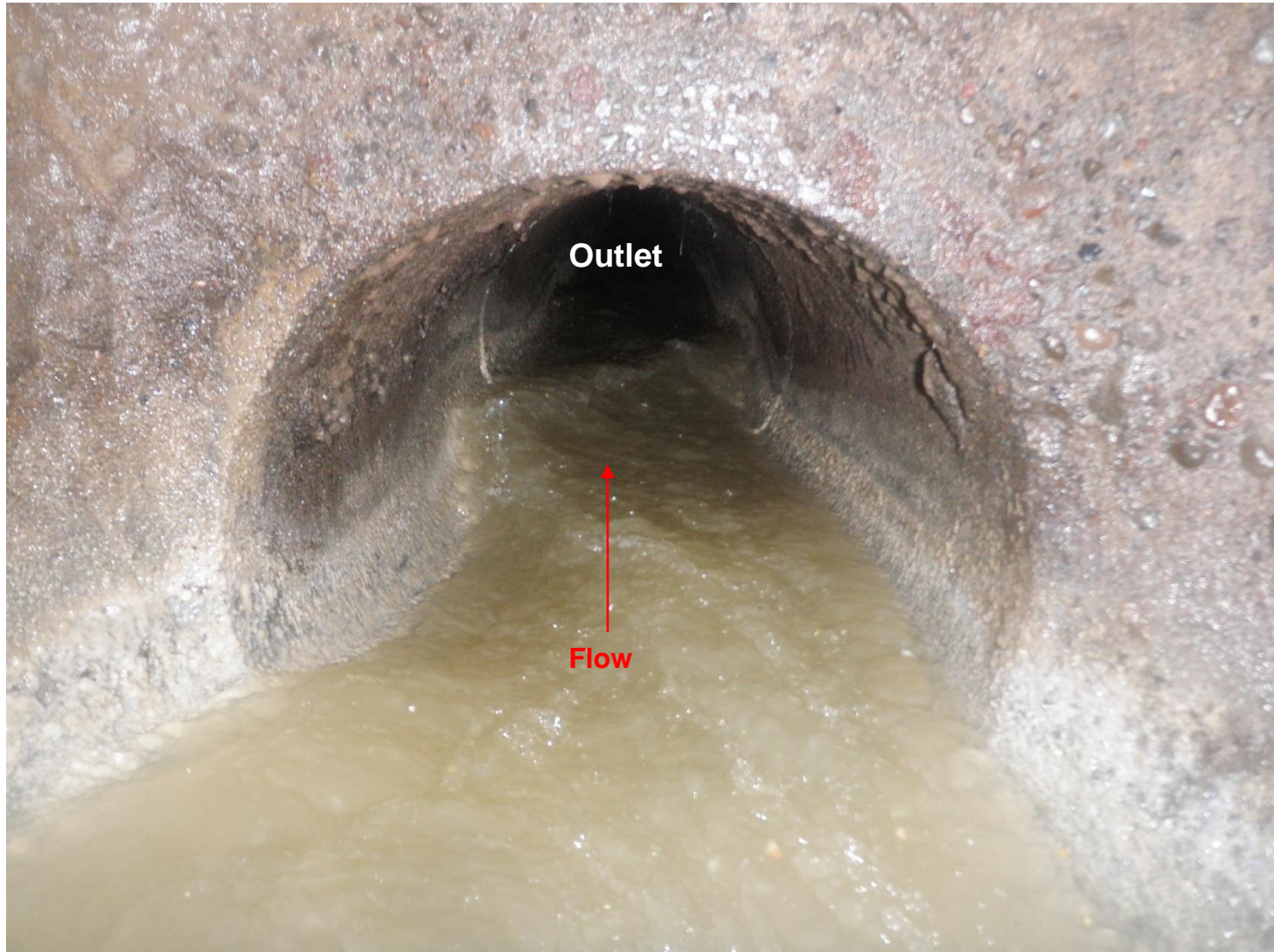
View of sensor placement and site hydraulics



Bend\_002069

Site outlet

**ADS ENVIRONMENTAL  
SERVICES®**



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_002069

## Flow Monitor

Bend\_002069

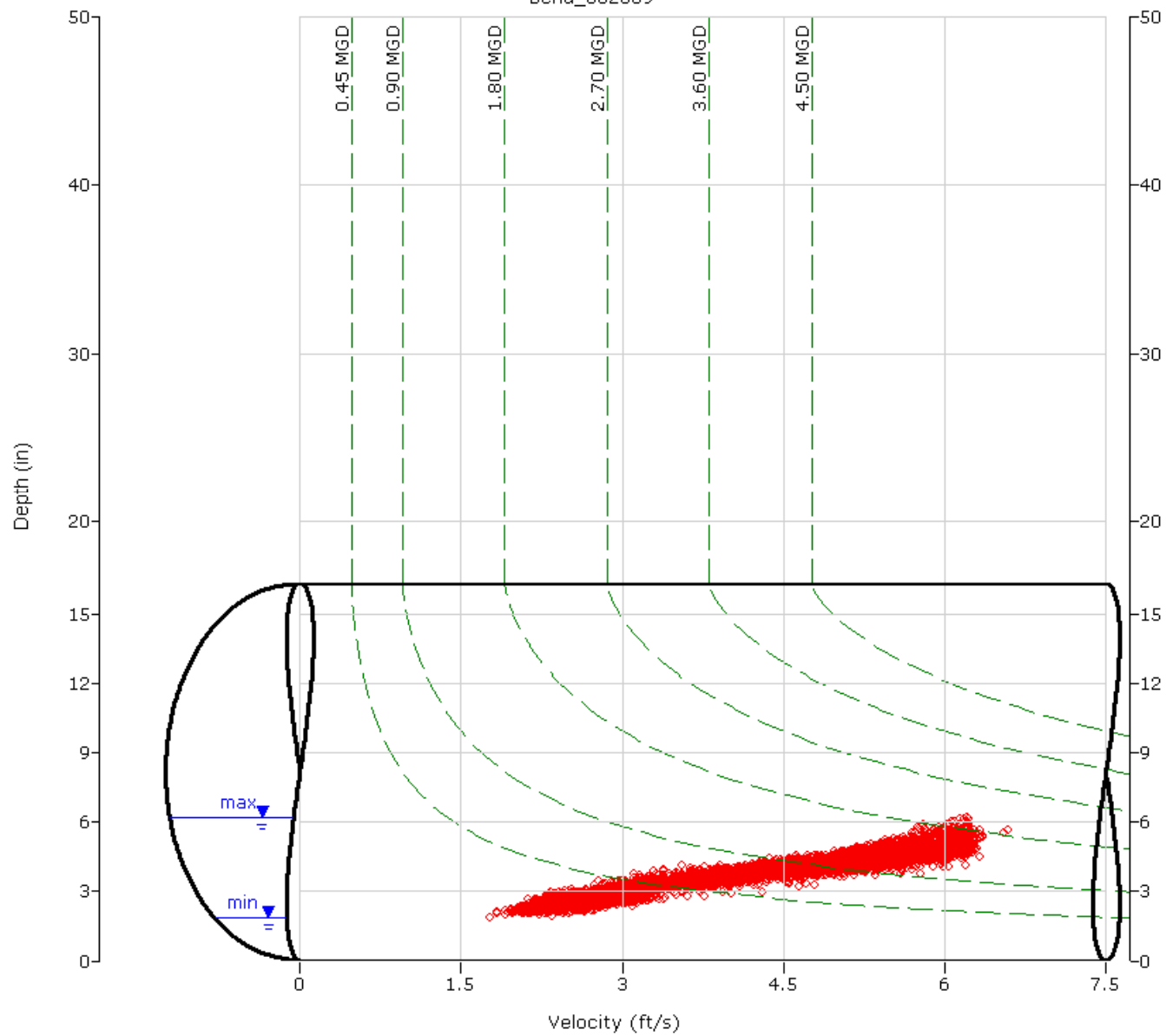
Pipe Height  
16.38 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_002069

## Flow Monitor

Bend\_002069

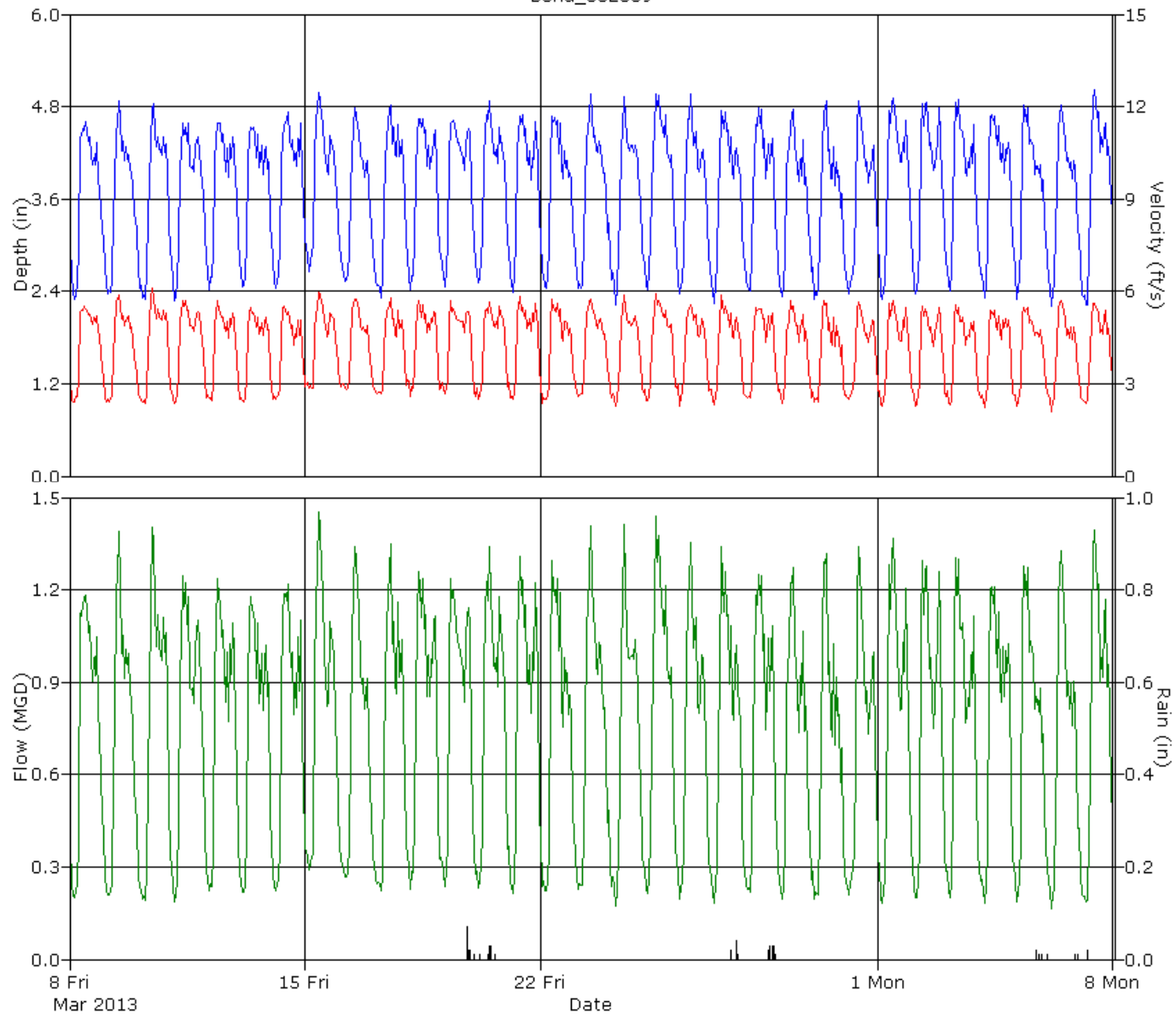
Pipe Height  
16.38 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





---

## Site Commentary

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### Site Information

Bend_002155	
Measured Pipe Height (in)	10
Nominal Pipe Height (in)	10
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_002155 was located in the Northeast of Bend (see attached site report for details).

The hydrograph indicates a residential/commercial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a fairly repeatable data set, however a hydraulic jump appears at a depth of approximately 2" and therefore the data set should be used with caution. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 20% (or higher as a result of the hydraulic jump). The hydraulic jump was seen in the initial data review phase, however the alternate monitoring locations also had additional hydraulic issues.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.60	1.34	0.059
Minimum	0.85	0.22	0.004
Maximum	3.64	3.14	0.284
Time of Minimum	4/2/2013 3:35 AM	3/19/2013 4:50 AM	3/10/2013 5:00 AM
Time of Maximum	4/1/2013 7:30 AM	3/19/2013 6:50 AM	3/31/2013 9:15 PM

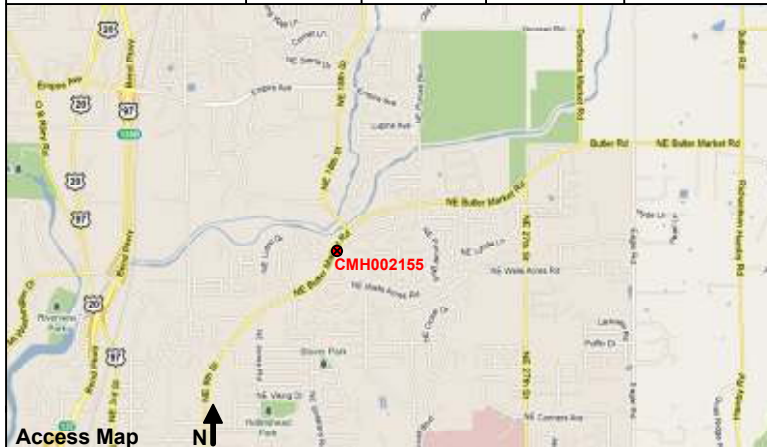
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_002155		Monitor Series: 5000 AG		Monitor S/N: 21704	
Address/Location: Northeast of NE Rungay Ln. on NE Butler Market Rd.		Manhole #		CMH002155	
		Coordinates:		44°04'50.48" N 121°16'54.23" W	
		Pipe Height:		10.00"	
Access: Drive		Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>
		Pipe Width:		10.00"	
		IP Address:		166.219.172.31	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/25/2013 @ 15:42	Manhole Depth:	~ 7'
Site Hydraulics:	Ripples	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	2.38" +/- .25"	Access Pole #:	Doesn't apply
Range (Air DOF):	7.63" +/- .25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	2.49 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultrasonic, Velocity, Pressure	Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height:	None observed	WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	JRRG	Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
---

5 psi pressure used at this location.



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_002155 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/25/13

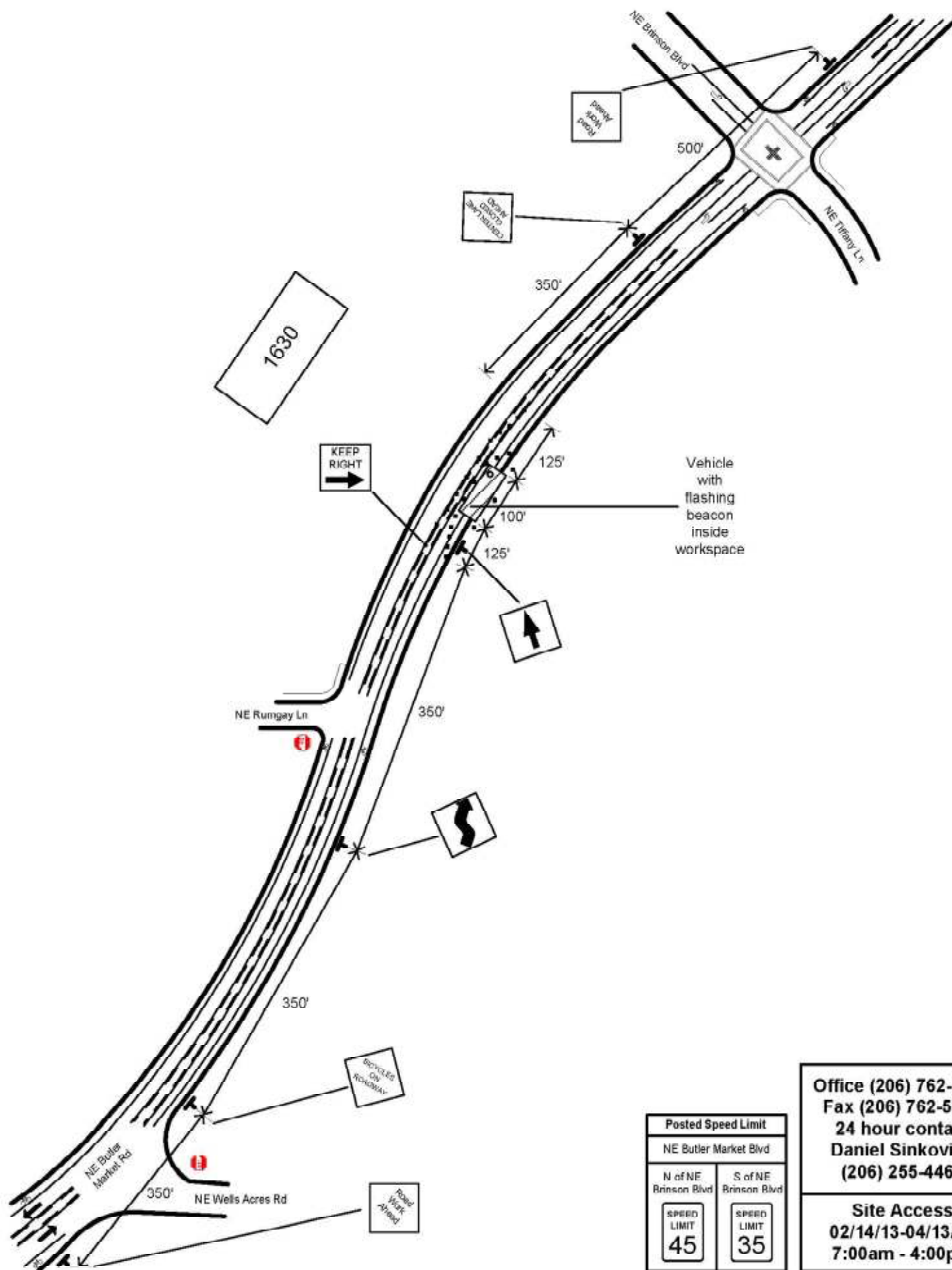
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/25/13





**Office (206) 762-5070**  
**Fax (206) 762-5077**  
**24 hour contact**  
**Daniel Sinkovich**  
**(206) 255-4464**

**Site Access**  
02/14/13-04/13/13  
7:00am - 4:00pm



Bend\_002155

Site location

**ADS ENVIRONMENTAL  
SERVICES®**



Site access looking northwest



Bend\_002155

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



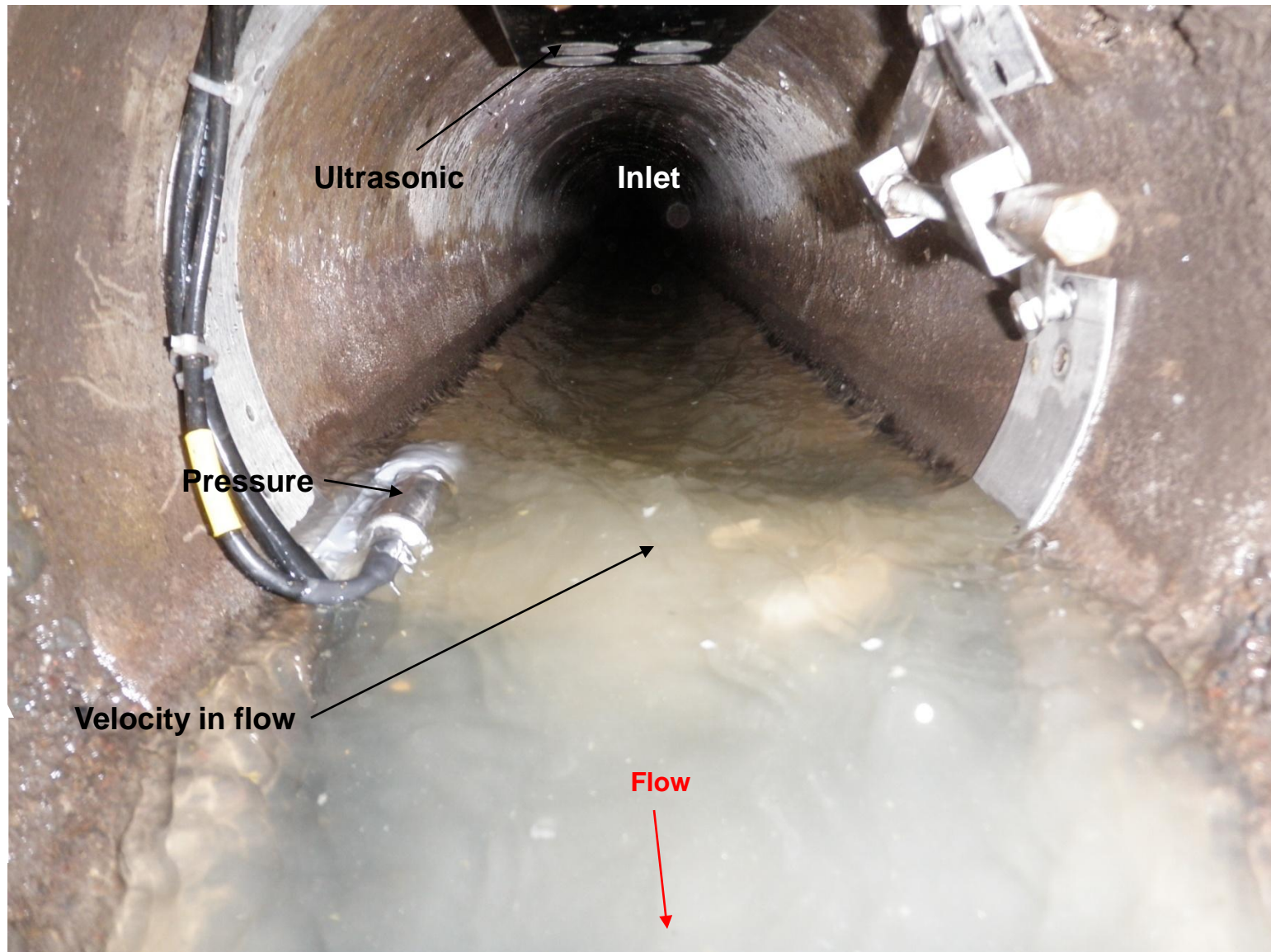
View down manhole facing north



Bend\_002155

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of sensor placement and site hydraulics



Bend\_002155

Site outlet

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_002155

## Flow Monitor

Bend\_002155

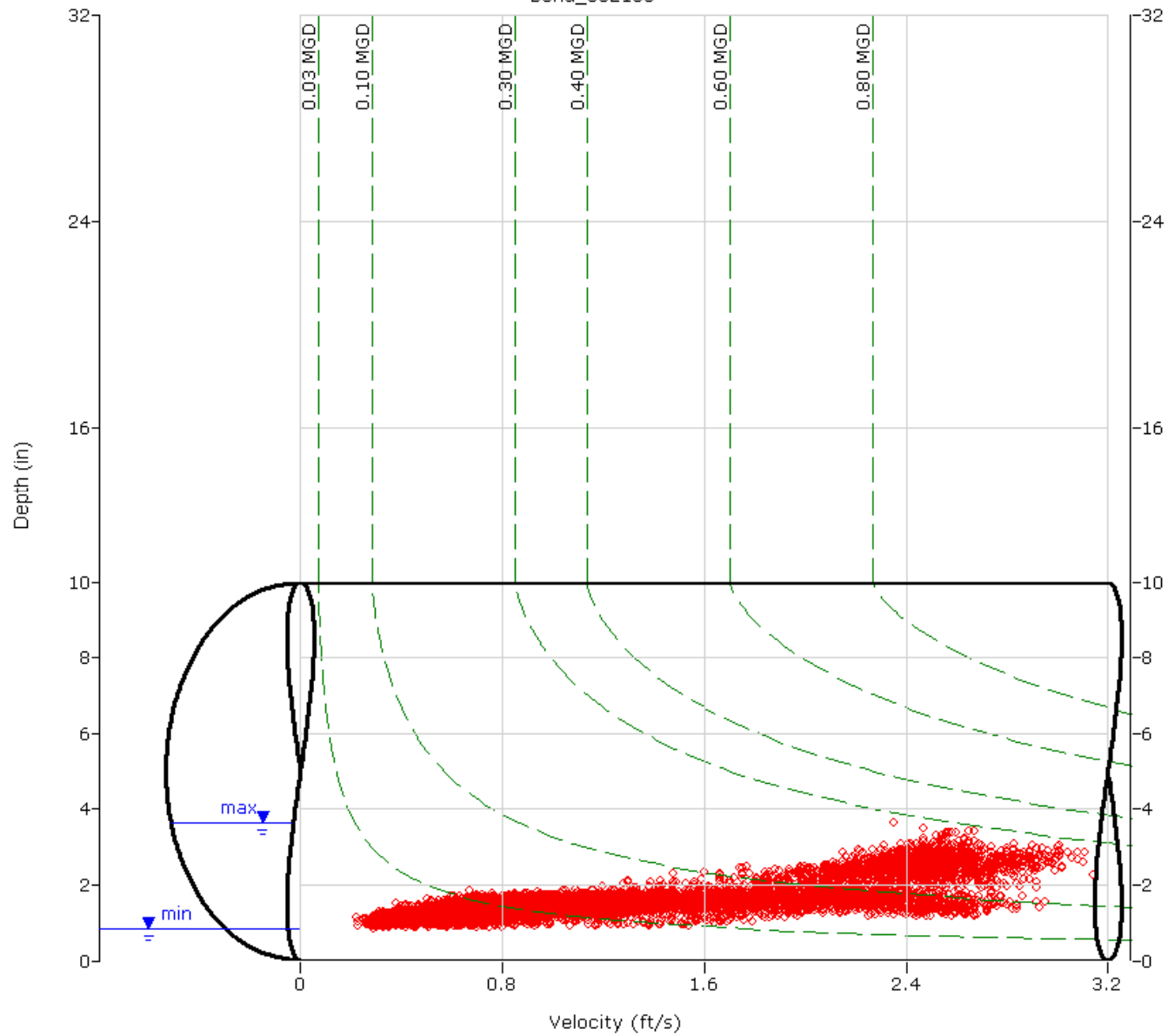
Pipe Height  
10.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_002155

## Flow Monitor

Bend\_002155

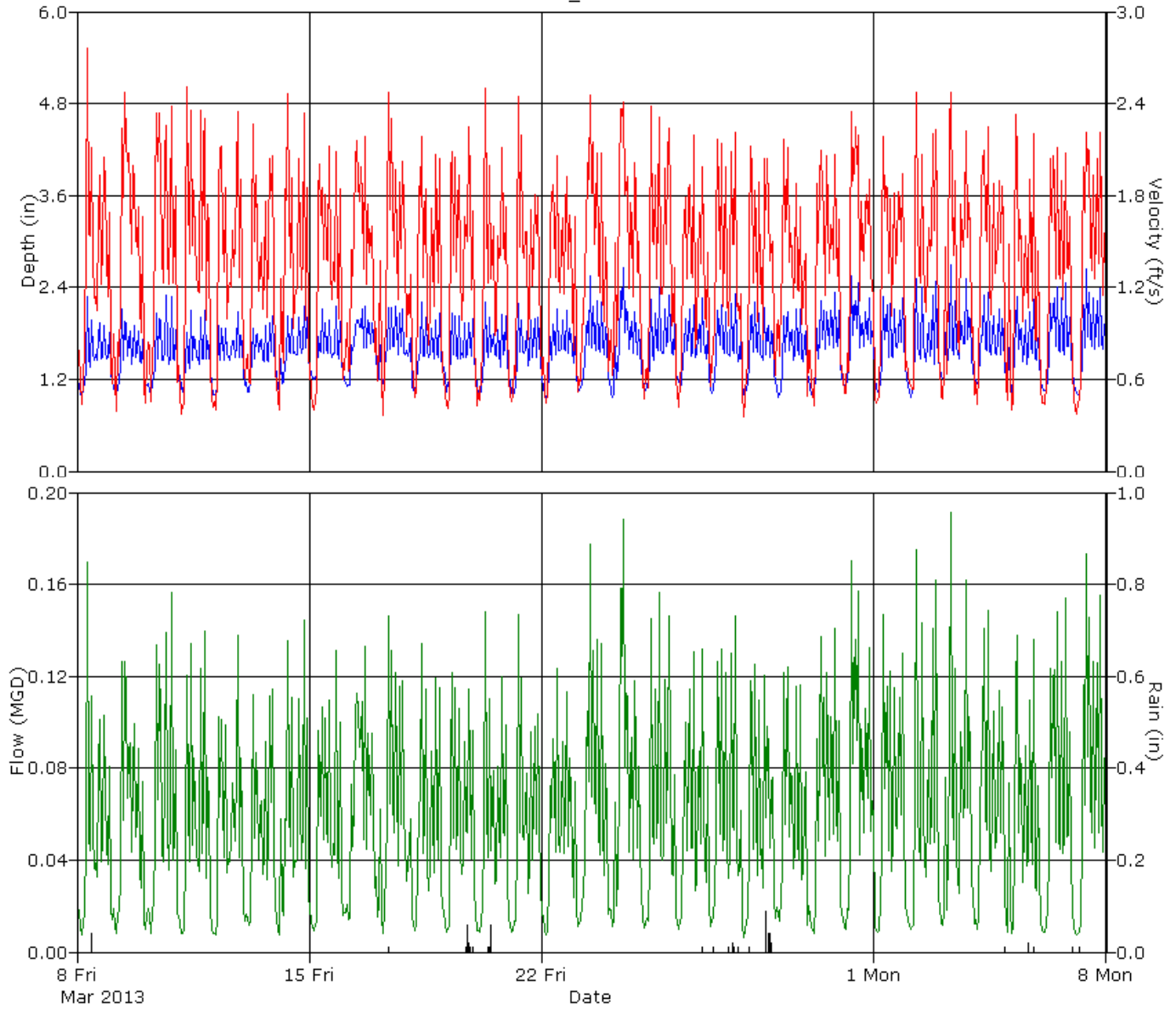
Pipe Height  
10.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_002247	
Measured Pipe Height (in)	20
Nominal Pipe Height (in)	20
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_002247 was located in the North of Bend (see attached site report for details).

The hydrograph indicates a commercial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with a backwater condition developing at depths greater than 5" (but only in one period from March 29 - 30, 2013 when a hydraulic shift is evident). The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 8%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.49	0.73	0.082
Minimum	1.51	0.34	0.022
Maximum	3.99	1.62	0.253
Time of Minimum	3/29/2013 12:00 PM	3/10/2013 3:30 AM	3/10/2013 3:30 AM
Time of Maximum	3/30/2013 11:40 PM	3/28/2013 11:50 AM	3/30/2013 9:35 AM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_002247		Monitor Series: 5000 AG		Monitor S/N: 20042	
Address/Location: South of 672 NE Butler Market Rd		Manhole #		CMH002247	
		Coordinates:		44°04'33.58"N 121°17'47.11"W	
		Pipe Height:		20.00"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 21.25
					IP Address: 166.219.172.39



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/23/13 @ 15:22	Manhole Depth:	~ 10'
Site Hydraulics:	Small waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	Waves and slight bend	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	Small waves	Telephone Information:	Doesn't apply
Depth of Flow:	2.38" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	17.62" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	0.79 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_002247 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

<input checked="" type="checkbox"/>	This worksite does NOT require a traffic control Plan
<input type="checkbox"/>	Standard Traffic Control Plan is to be used at this work site
<input type="checkbox"/>	This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich  
 Signature: Signed copy can be obtained from ADS  
 Date: 2/23/13

#### Reviewed

Project Mgr Name: Mike Pina  
 Signature: Signed copy can be obtained from ADS  
 Date: 2/23/13



Bend\_002247

Site Access

**ADS ENVIRONMENTAL  
SERVICES®**



Butler Market Rd.

Site Location

Site access looking east



Bend\_002247

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



View of site looking north



Bend\_002247

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



**View of inlet and sensors**



Bend\_002247

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of outlet



# SCATTERGRAPH REPORT

Bend\_002247

## Flow Monitor

Bend\_002247

Pipe Height  
20.00 in

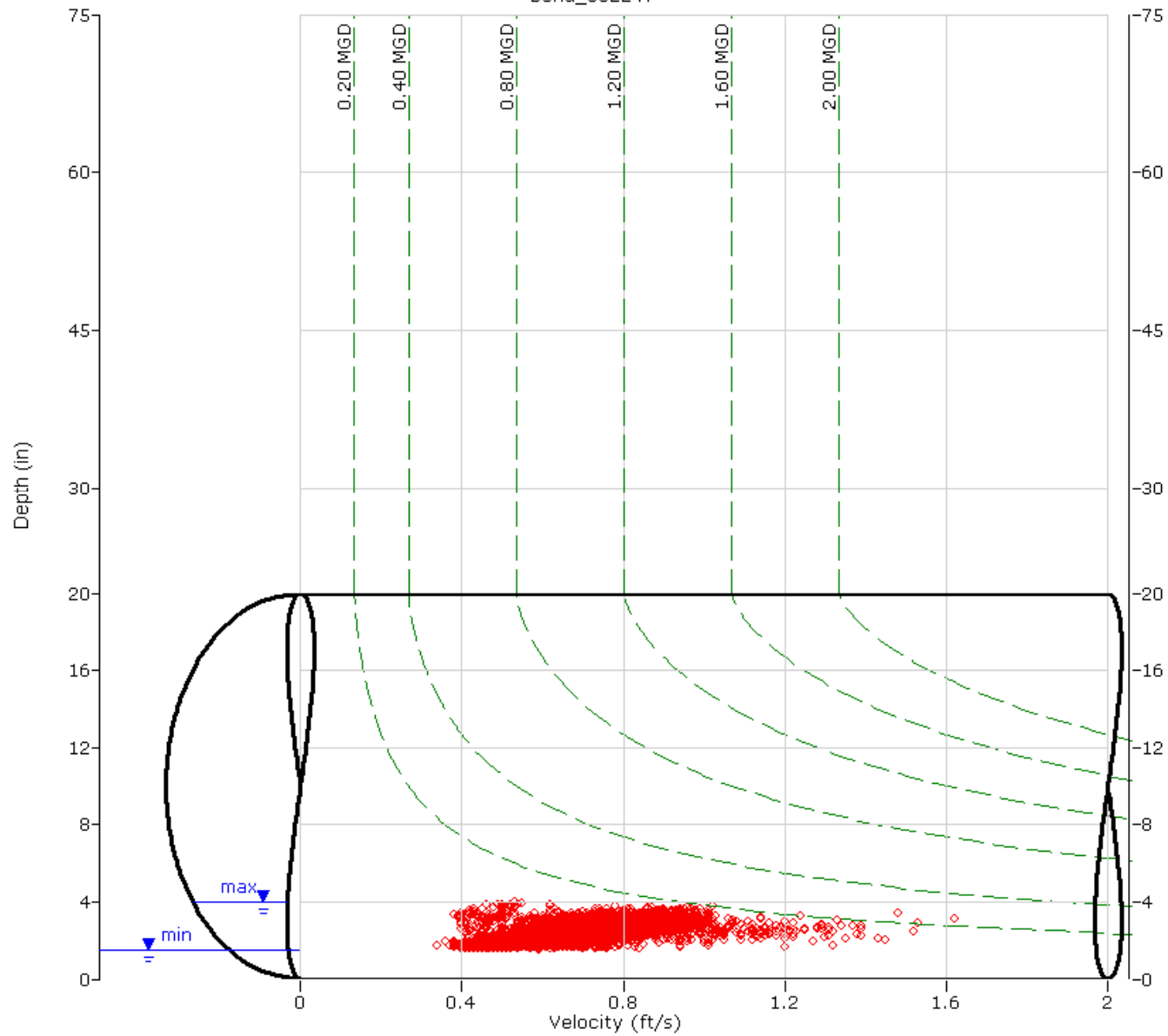
## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth

AGS ENVIRONMENTAL  
SERVICES





# HYDROGRAPH REPORT

Bend\_002247

## Flow Monitor

Bend\_002247

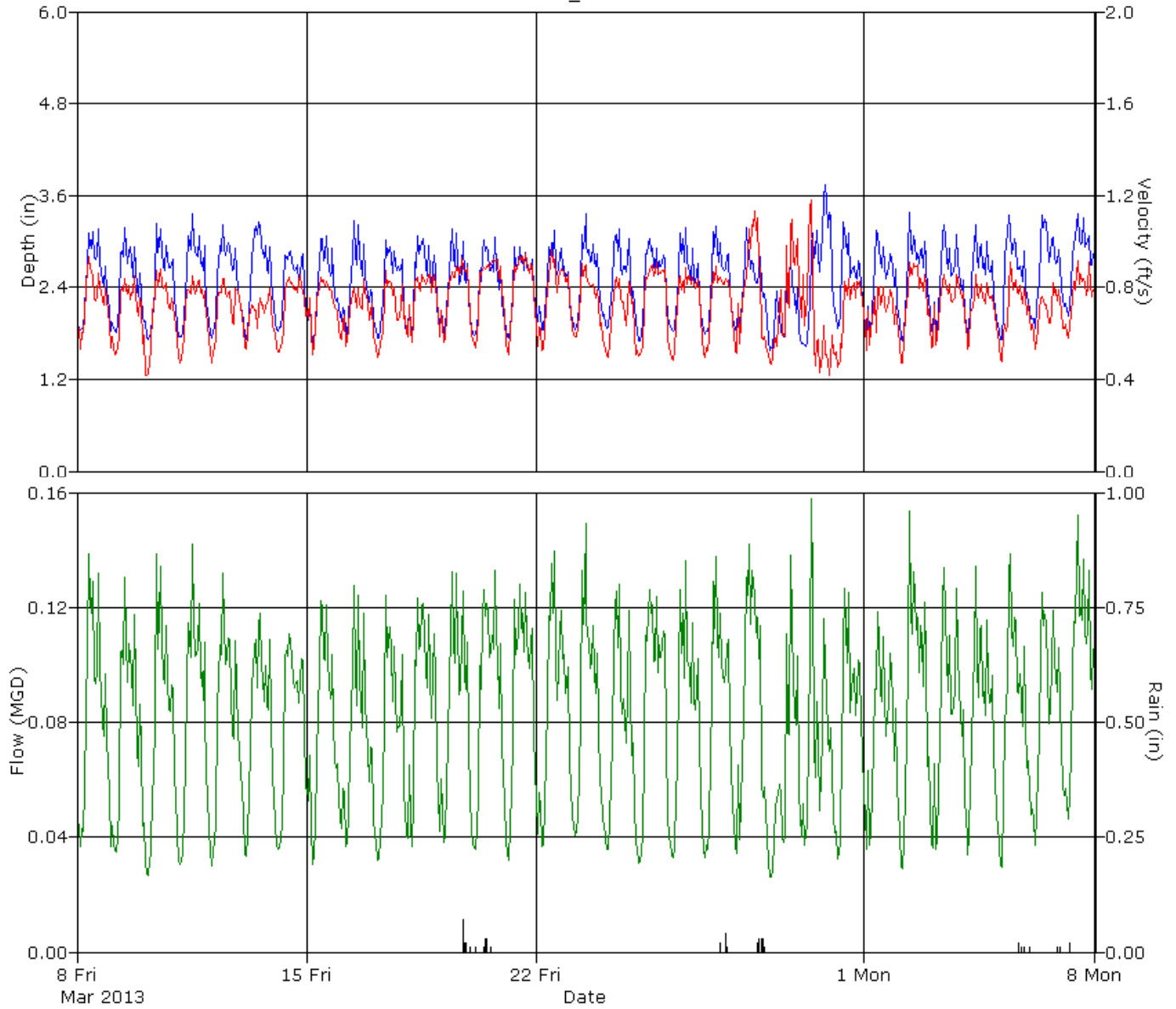
Pipe Height  
20.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





---

## Site Commentary

---

### Site Information

Bend_002286	
Measured Pipe Height (in)	11.75
Nominal Pipe Height (in)	12
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_002286 was located in the East of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.53	1.24	0.171
Minimum	1.60	0.38	0.018
Maximum	6.38	2.17	0.576
Time of Minimum	3/14/2013 2:32 AM	3/21/2013 4:30 AM	3/14/2013 2:28 AM
Time of Maximum	3/24/2013 10:46 AM	3/24/2013 10:44 AM	3/24/2013 10:46 AM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Bend\_002286

Site Access

**ADS** ENVIRONMENTAL  
SERVICES®



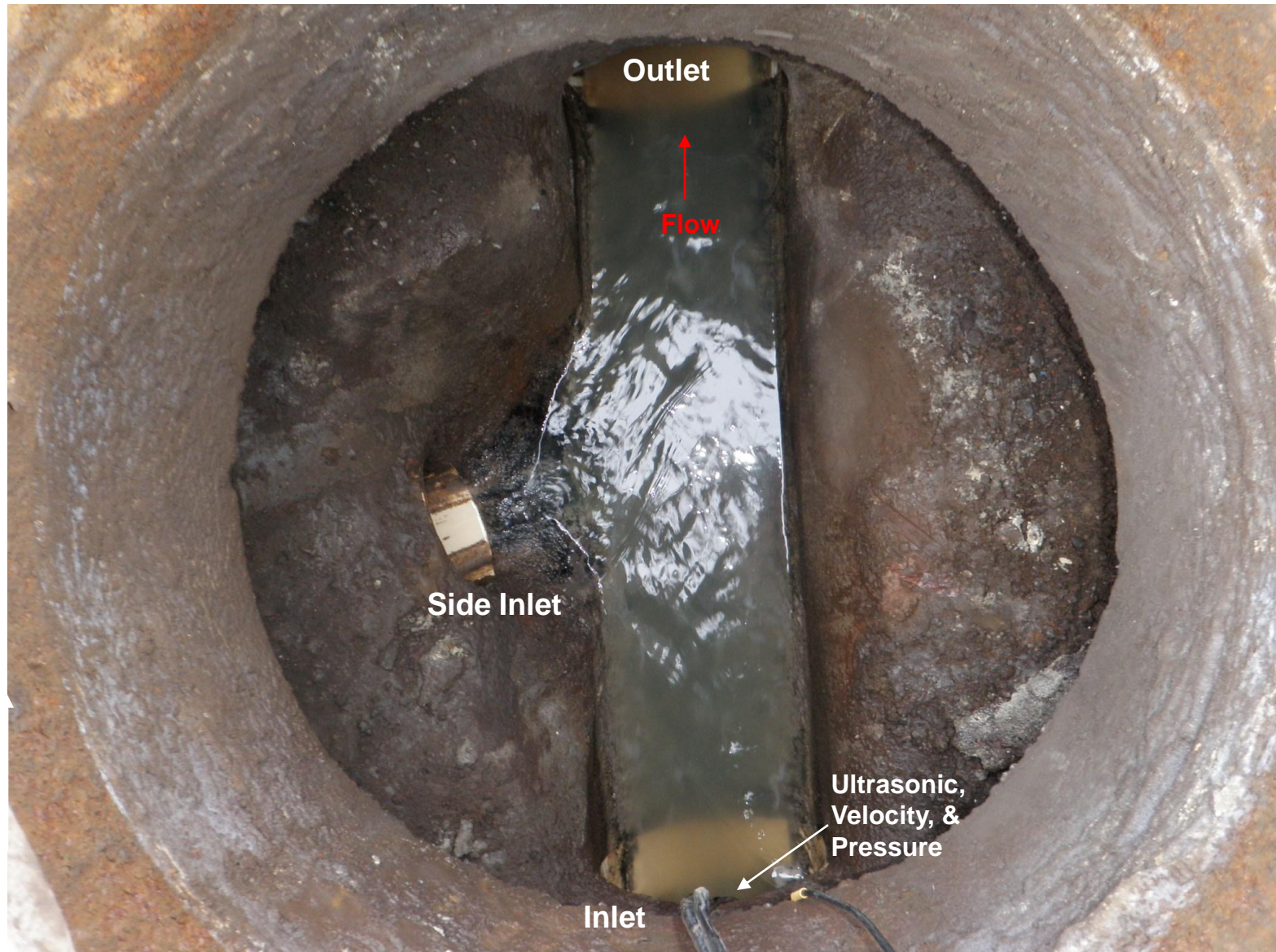
Site access looking southeast



Bend\_002286

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



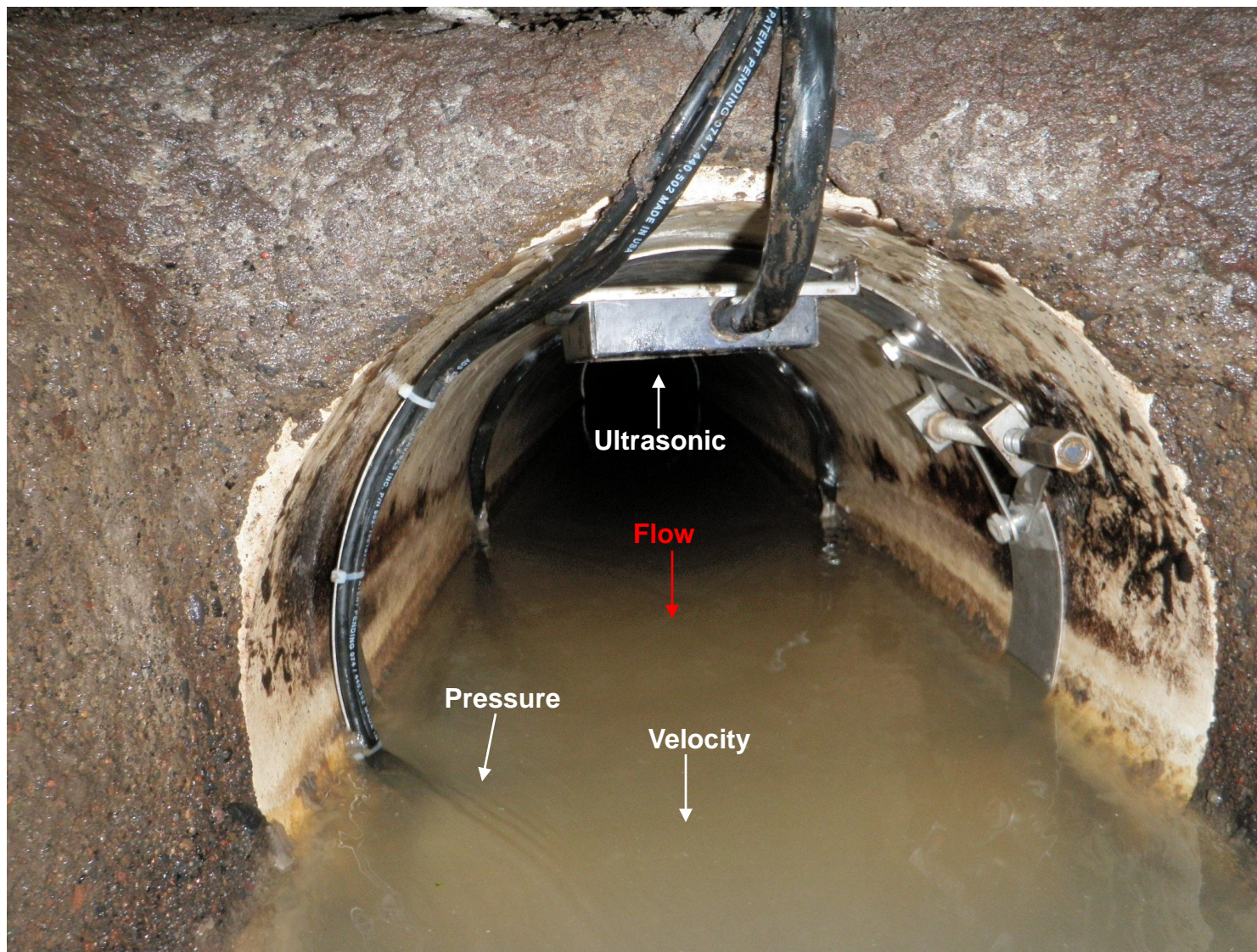
View of site looking north



Bend\_002286

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of inlet and sensors



Bend\_002286

Site set up

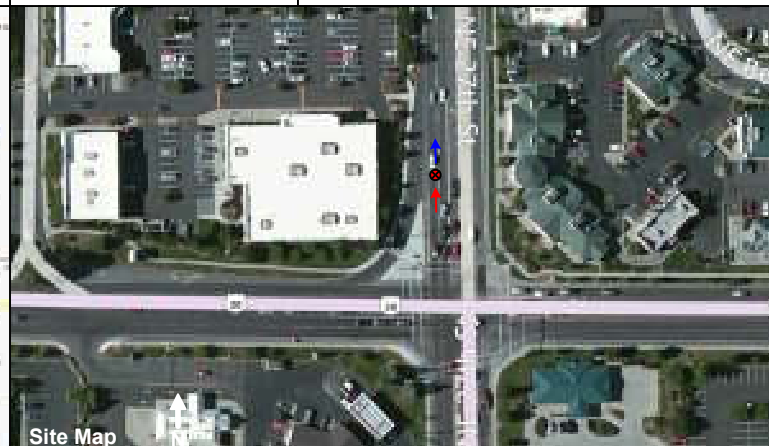
**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_002286		Monitor Series: 5000 AG		Monitor S/N: 21502	
Address/Location: 2690 US Hwy 20 East of Barnes and Nobles on NE 27 <sup>th</sup> St		Manhole #		CMH002286	
		Coordinates:		44°03'19.11"N 121°15'49.54"W	
		Pipe Height:		11.75"	
Access: Drive		Type of System:		Pipe Width: 11.75"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.172.64	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	3/06/13 @ 13:35	Manhole Depth:	~ 3'
Site Hydraulics:	Smooth flow	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	Did not investigate	Mini System Character:	Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Did not investigate	Telephone Information:	Doesn't apply
Depth of Flow:	3.50" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	8.25" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.42 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type: Standard		Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure		Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed		WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_SGRG		Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
---

5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_002286 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input checked="" type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input checked="" type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site should note be accessed during peak traffic hours (7:00-9:00PM & 3:00-6:00PM).

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 3/06/13

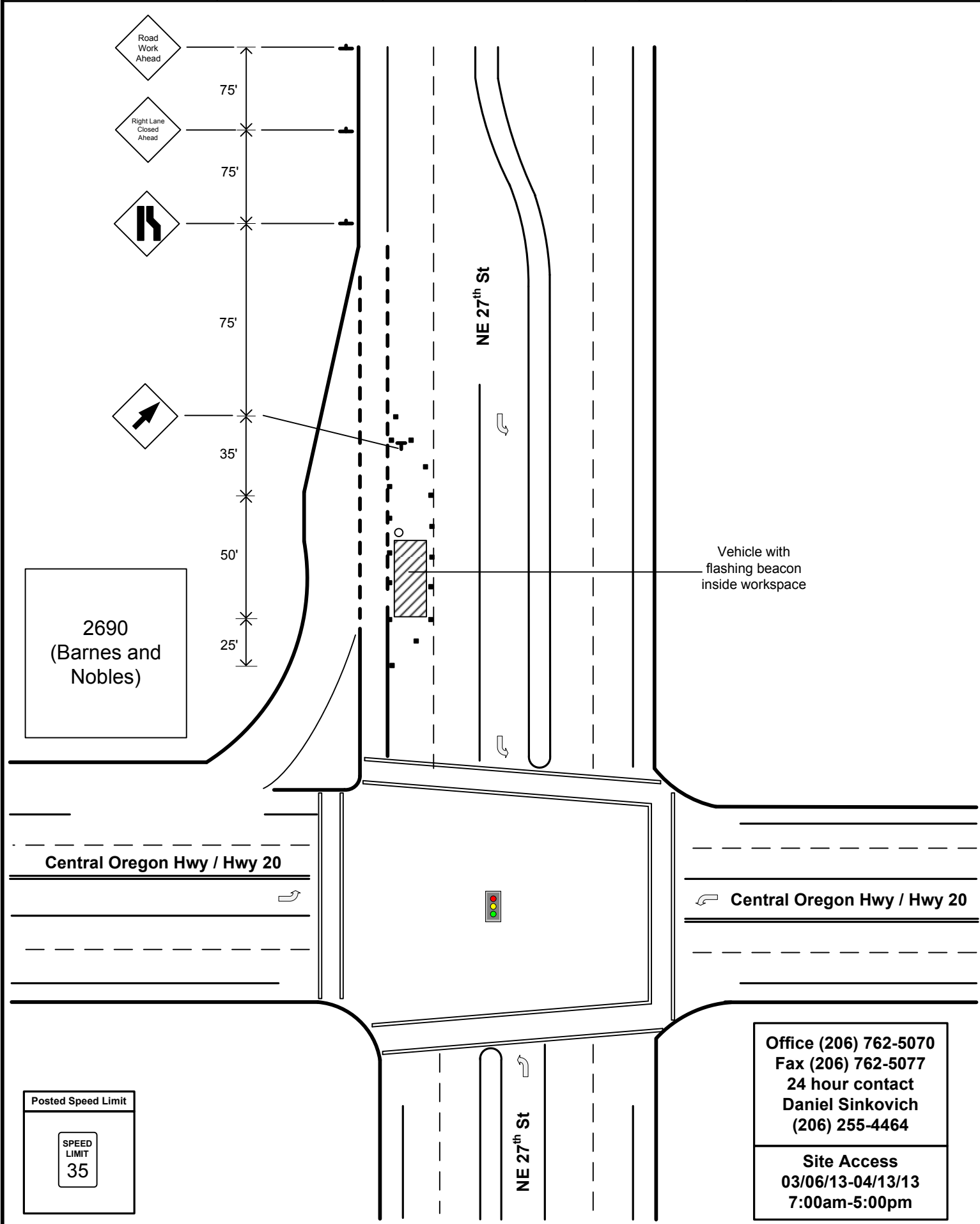
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 3/06/13







# SCATTERGRAPH REPORT

Bend\_002286

## Flow Monitor

Bend\_002286

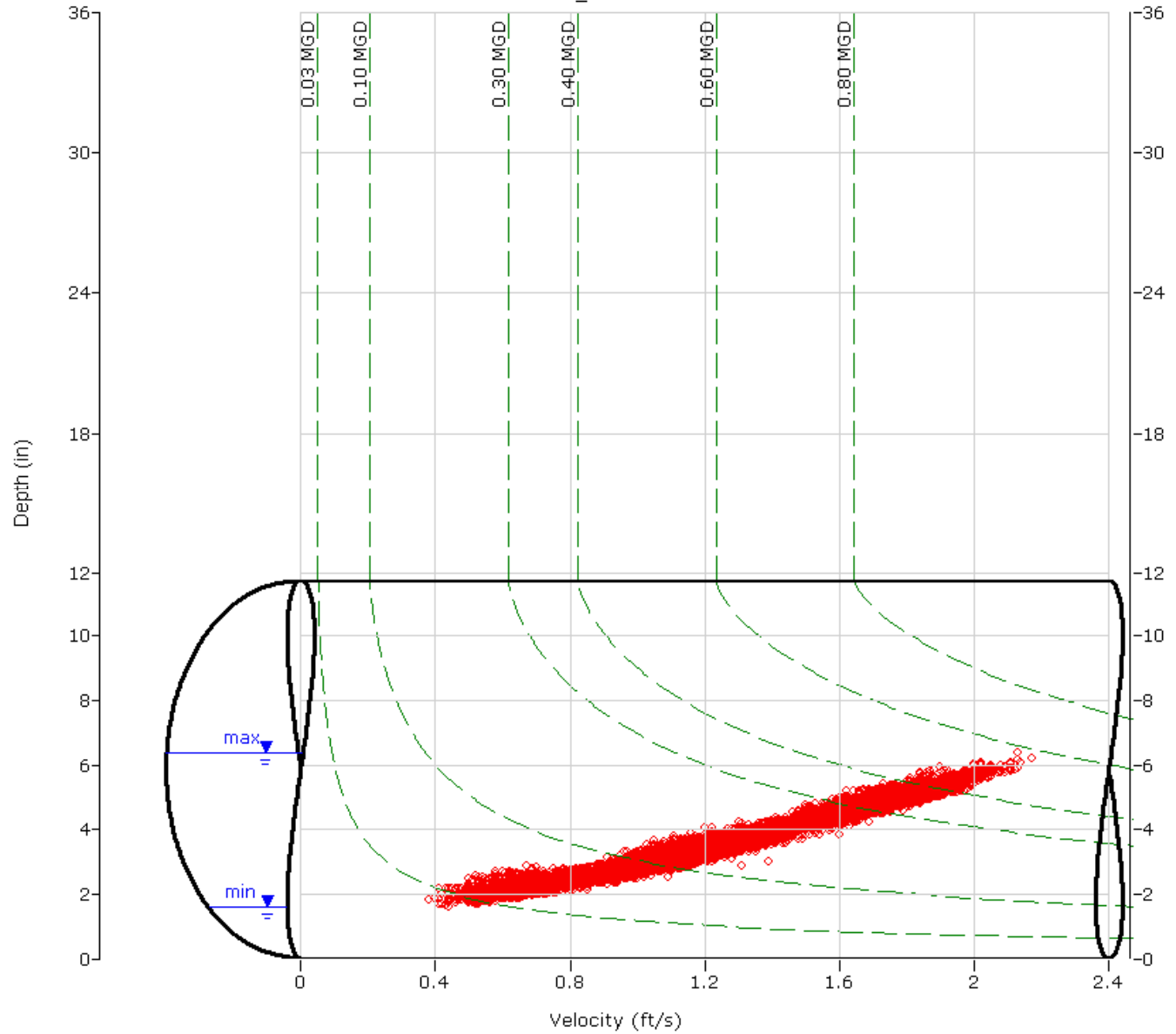
Pipe Height  
11.75 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_002286

## Flow Monitor

Bend\_002286

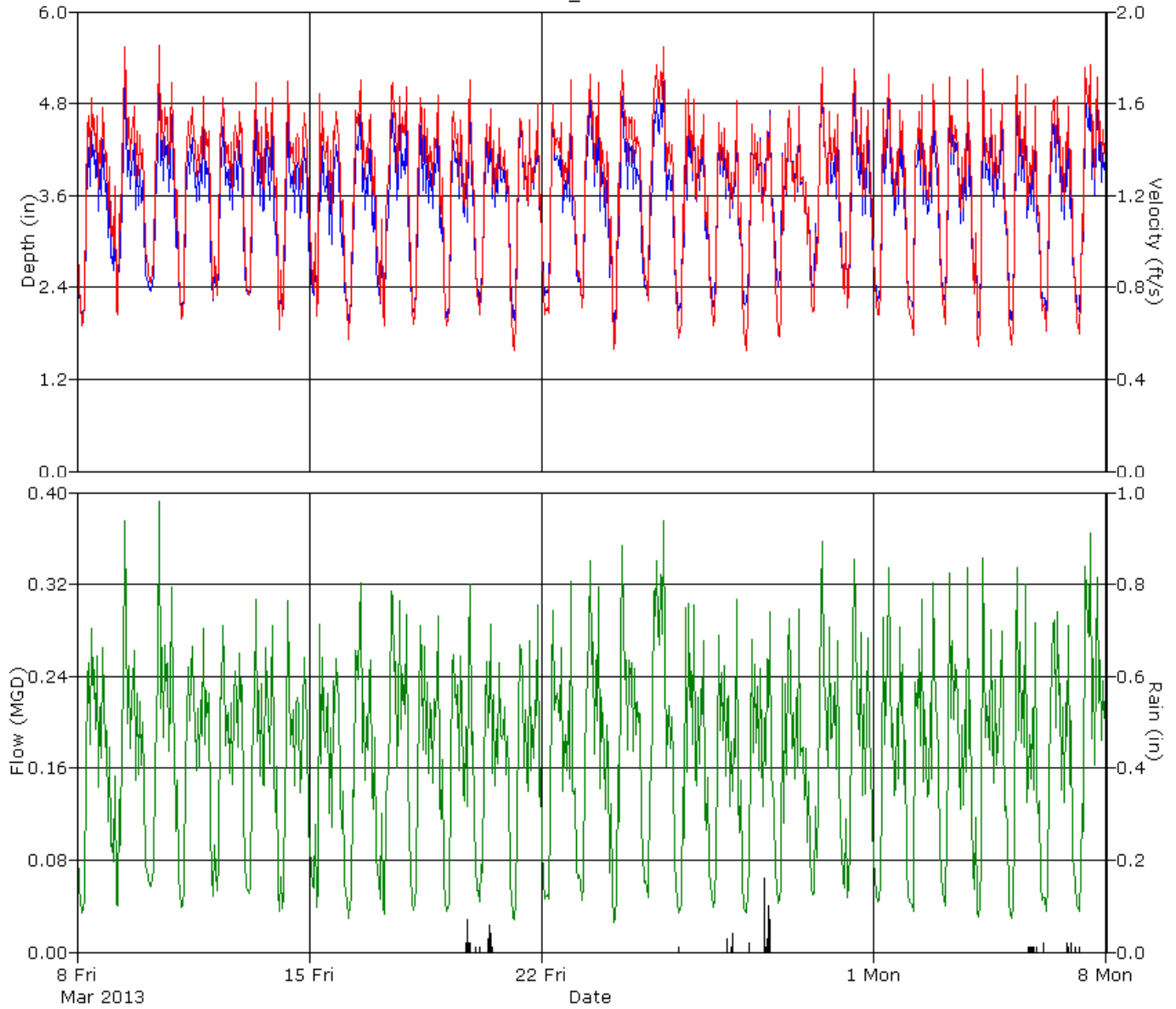
Pipe Height  
11.75 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_002346	
Measured Pipe Height (in)	20.63
Nominal Pipe Height (in)	21
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_002346 was located in the Northeast of Bend (see attached site report for details).

The hydrograph indicates a residential/commercial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set, with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.97	2.10	0.469
Minimum	1.23	0.71	0.029
Maximum	6.80	3.08	1.314
Time of Minimum	3/15/2013 5:05 AM	3/26/2013 4:50 AM	3/15/2013 5:10 AM
Time of Maximum	3/14/2013 9:15 PM	3/10/2013 2:30 PM	3/14/2013 9:15 PM

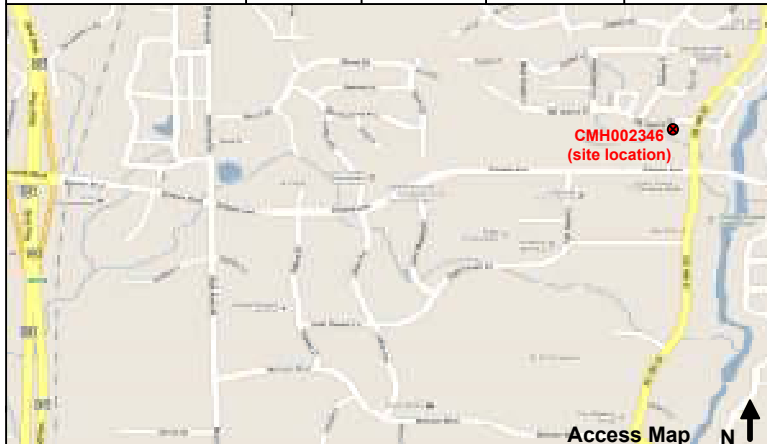
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_002346		Monitor Series: 5000 AG		Monitor S/N: 21499	
Address/Location: 20838 NE Sierra Dr.		Manhole #		CMH002346	
		Coordinates:		44° 5'32.28"N 121°16'53.59"W	
		Pipe Height:		20.63"	
Access: Drive		Type of System:		Pipe Width: 20.63"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.172.44	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/22/2013 @ 15:35	Manhole Depth:	~ 6'
Site Hydraulics:	Smooth and steady flow	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	L/S	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	3.13" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	17.50" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.77 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Cross Section</p>	<p>Planar</p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultrasonic, Velocity, Pressure	Lift / Pump Station		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	~ 300 ft.
Surcharge Height:	None observed	WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	Bend_JRRG	Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:	
5 PSI pressure used at this location	



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_002346 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☒ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/22/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/22/13



Bend\_002346

Site location

**ADS ENVIRONMENTAL  
SERVICES®**



Site access

Site access looking north



Bend\_002346

Site set up

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SERVICES®



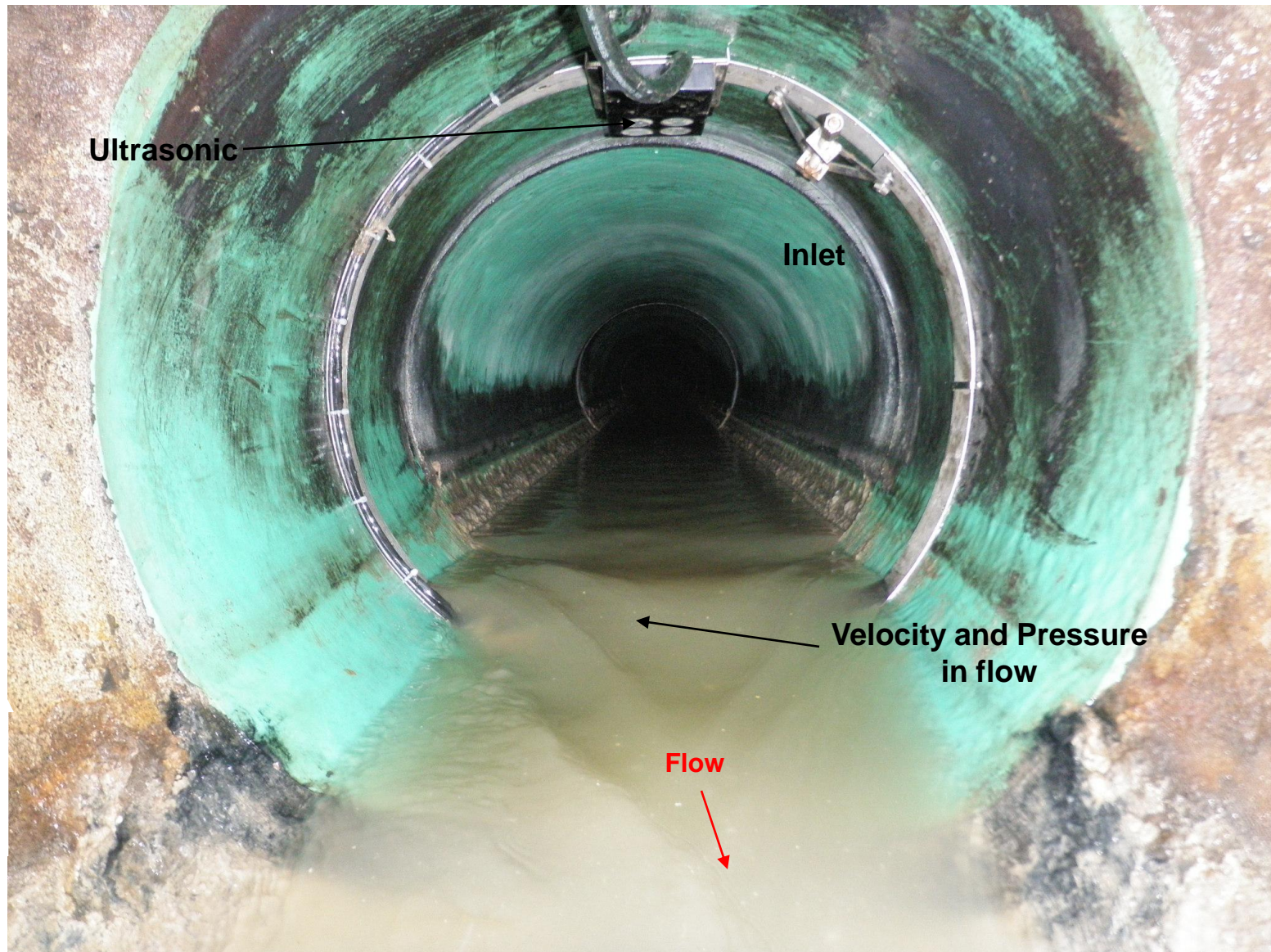
View down manhole facing north



Bend\_002346

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



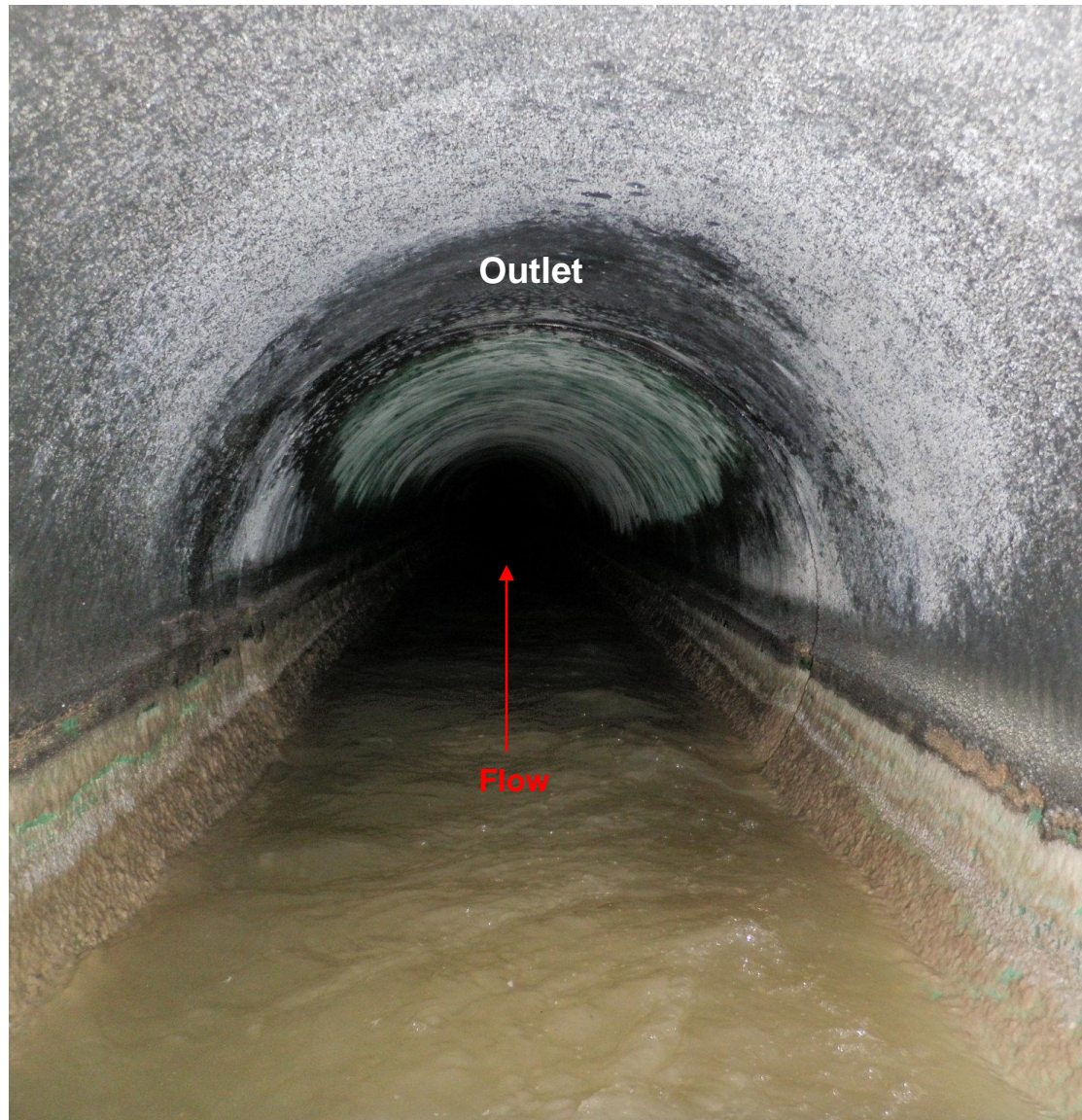
View of sensor placement and site hydraulics



Bend\_002346

Site outlet

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_002346

## Flow Monitor

Bend\_002346

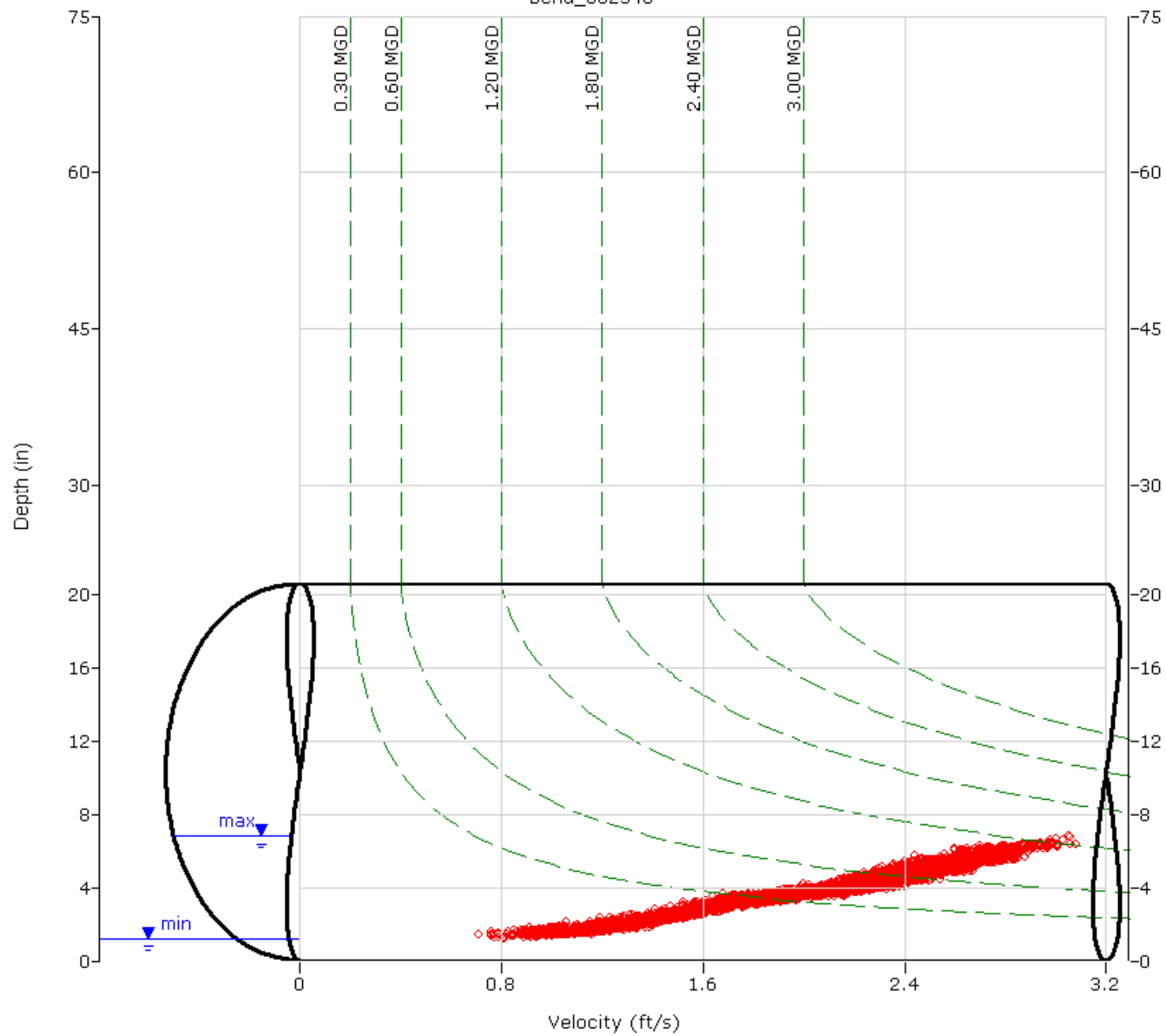
Pipe Height  
20.63 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_002346

## Flow Monitor

Bend\_002346

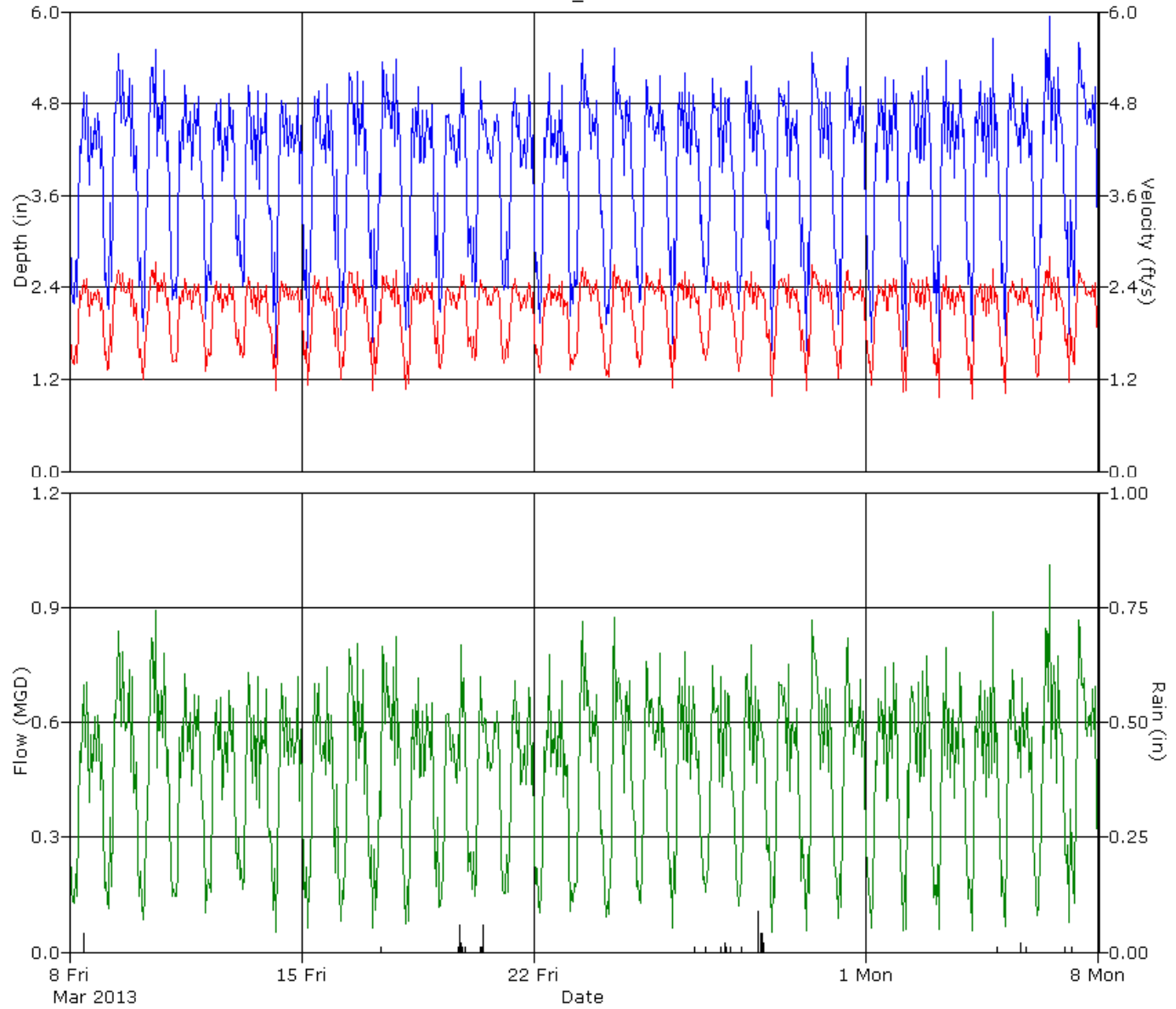
Pipe Height  
20.63 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_002538	
Measured Pipe Height (in)	9.75
Nominal Pipe Height (in)	10
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_002538 was located in the West of Bend (see attached site report for details).

The hydrograph indicates a diurnal flow pattern with a significant lift station influence during the period Friday March 8, 2013 to Sunday, April 07, 2013. In order to try and best capture the lift station peaks, the sample rate was set to 2-minute. The scattergraph for this location indicates a fairly repeatable data set with some scatter attributed to the pump station influence. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 8, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 2-minute sample rate from Friday, March 8, 2013 to Sunday, April 07, 2013.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.55	3.04	0.181
Minimum	0.34	0.17	0.002
Maximum	4.34	7.88	1.106
Time of Minimum	3/10/2013 11:46 PM	3/11/2013 2:26 AM	3/9/2013 5:20 AM
Time of Maximum	3/11/2013 7:42 AM	3/8/2013 7:04 AM	3/11/2013 7:42 AM

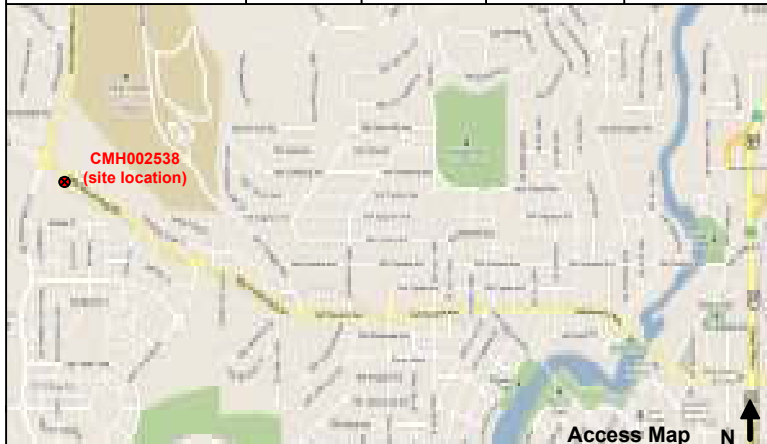
### Data Quality

The data uptime for the Friday, March 8, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 2-minute data points divided by the total number of 2-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	98
Velocity	100
Quantity	98



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_002538		Monitor Series: 5000 AG		Monitor S/N: 21722	
Address/Location: 2555 NW Shevlin Park Rd (south of road in the grass easement)		Manhole #		CMH002538	
		Coordinates:		44° 4'2.54"N 121°21'14.32"W	
		Pipe Height:		9.75"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 9.88"
					IP Address: 166.219.172.47



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/19/2013 @ 15:43	Manhole Depth:	~ 12'
Site Hydraulics:	Smooth, low, and slow flow. Fast wavy w/pump on.	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	Multiple L/S (~ 500')	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	2.38" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	7.38" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	5.71 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Cross Section</p>	<p>Planar</p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None Observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_002538 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☒ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/19/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/19/13



Bend\_002538

Site location



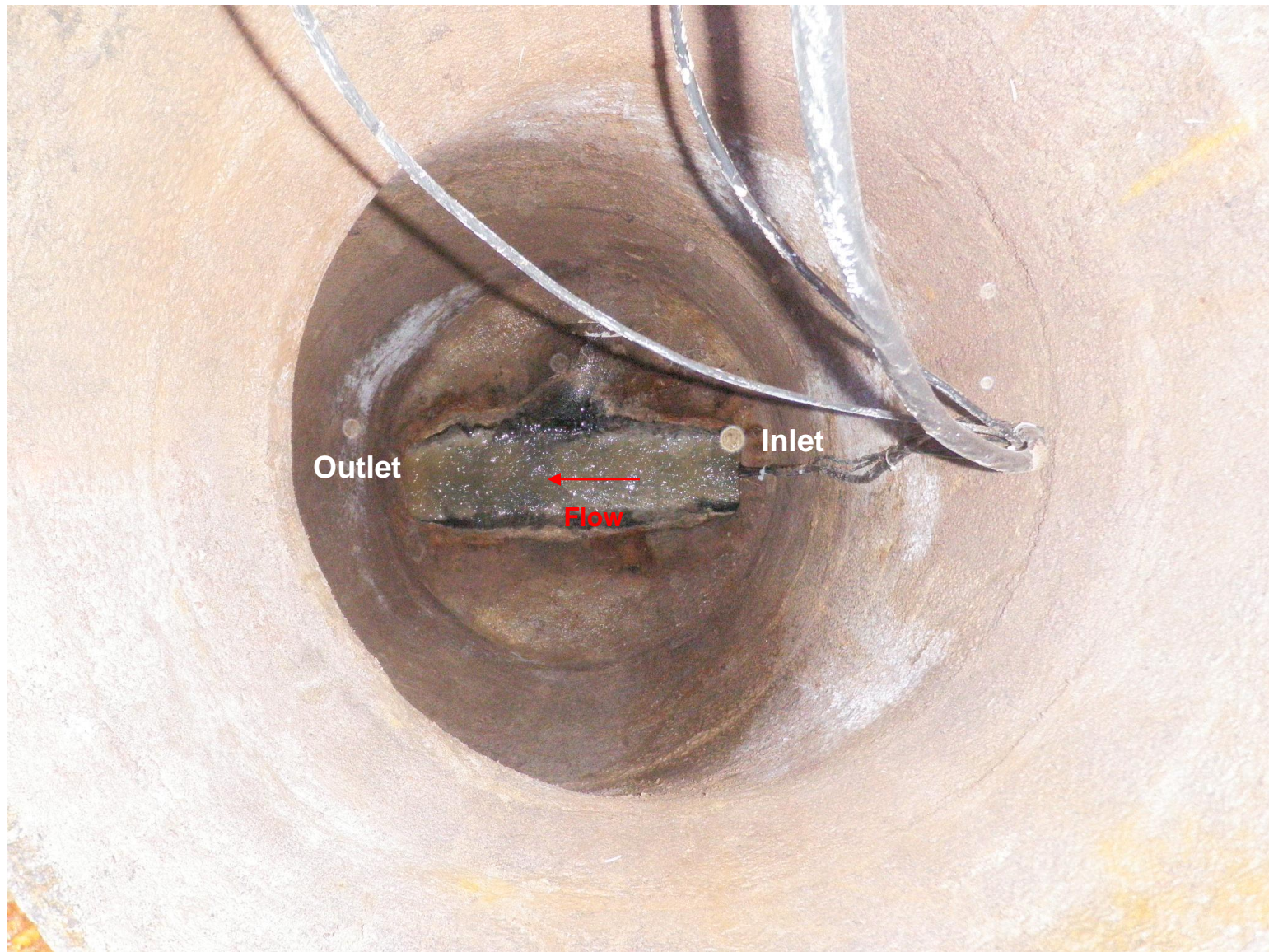
Site access looking north



Bend\_002538

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



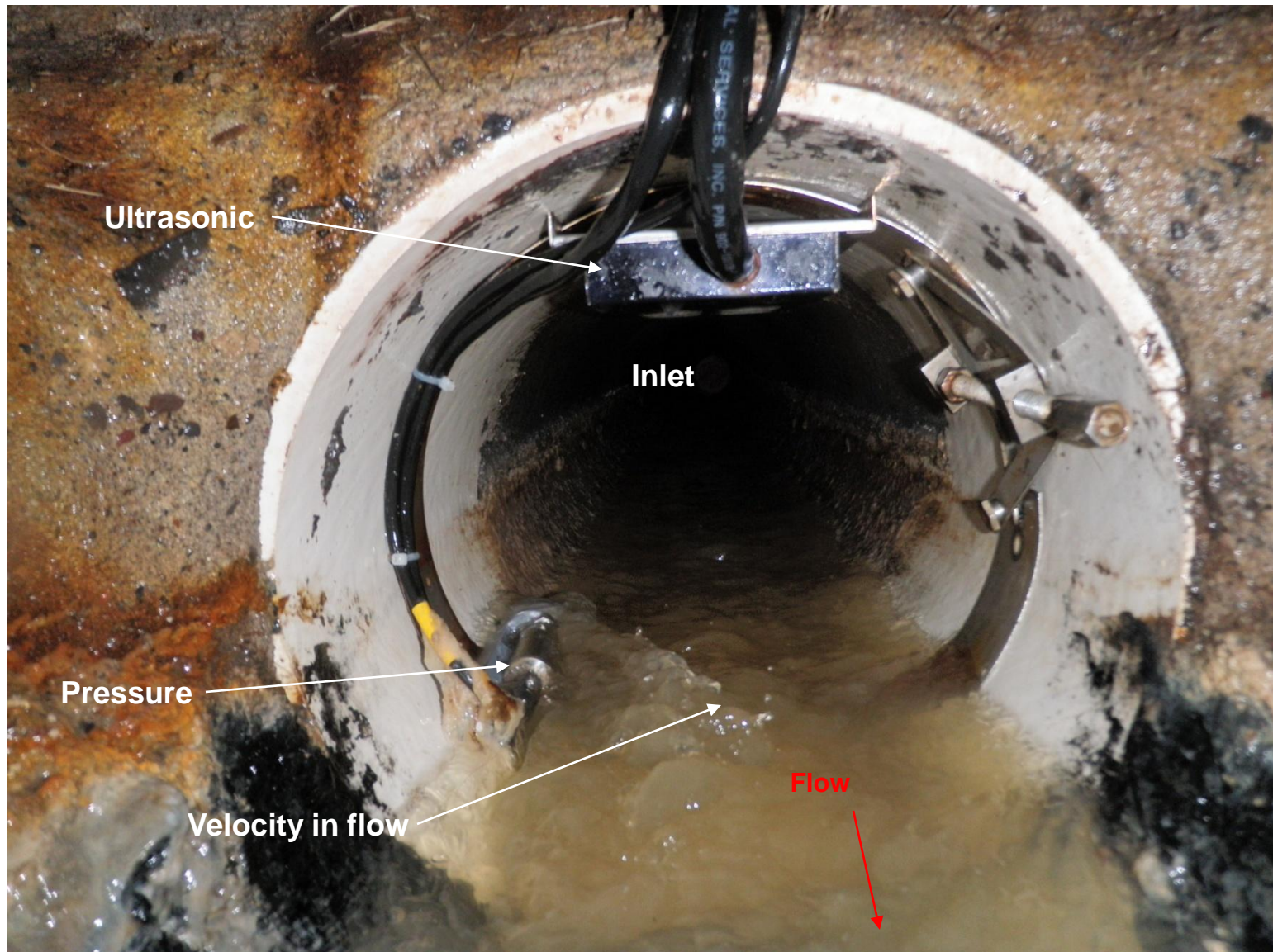
View down manhole facing north



Bend\_002538

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



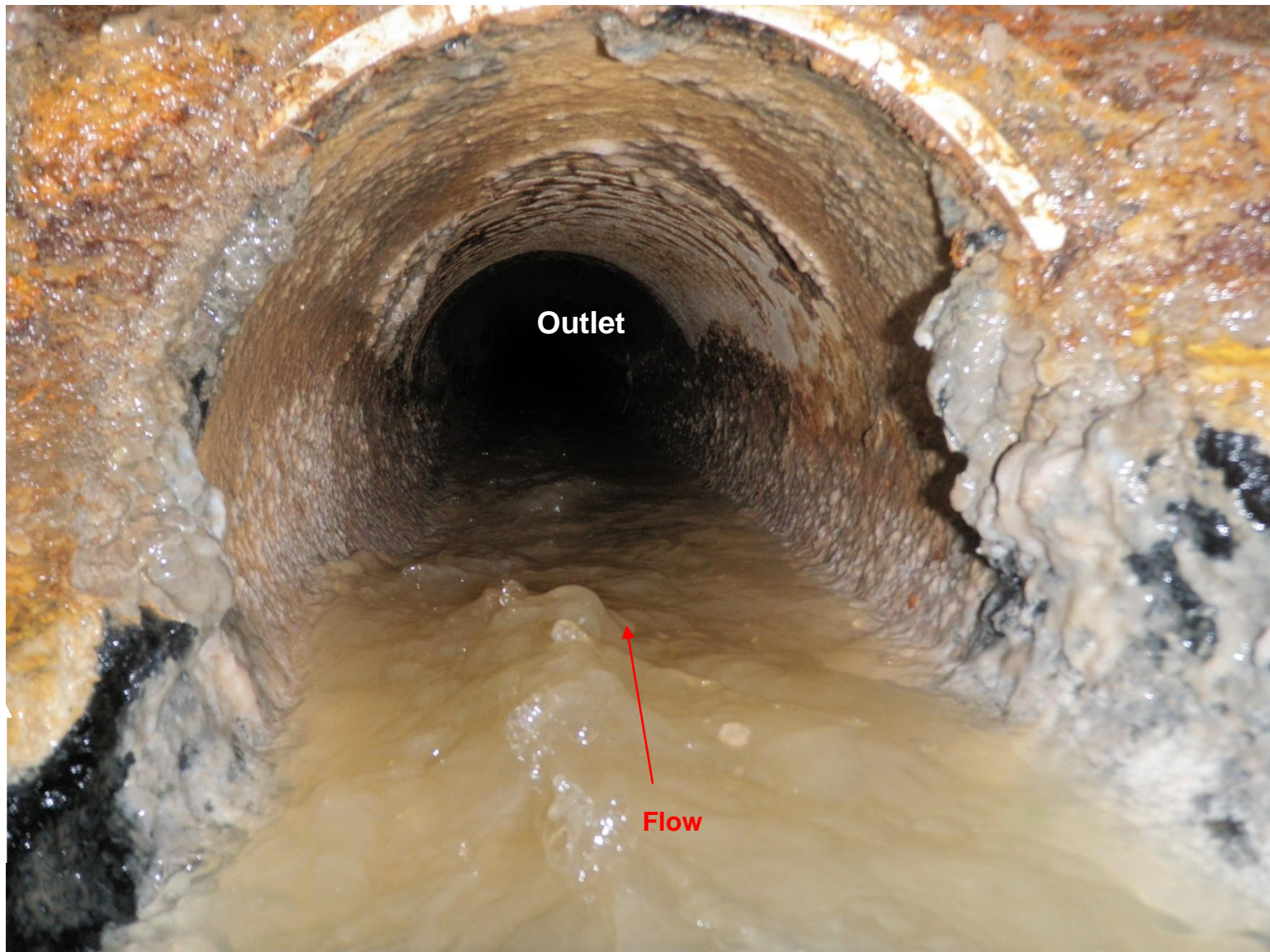
View of sensor placement and site hydraulics



Bend\_002538

Site outlet

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_002538

## Flow Monitor

Bend\_002538

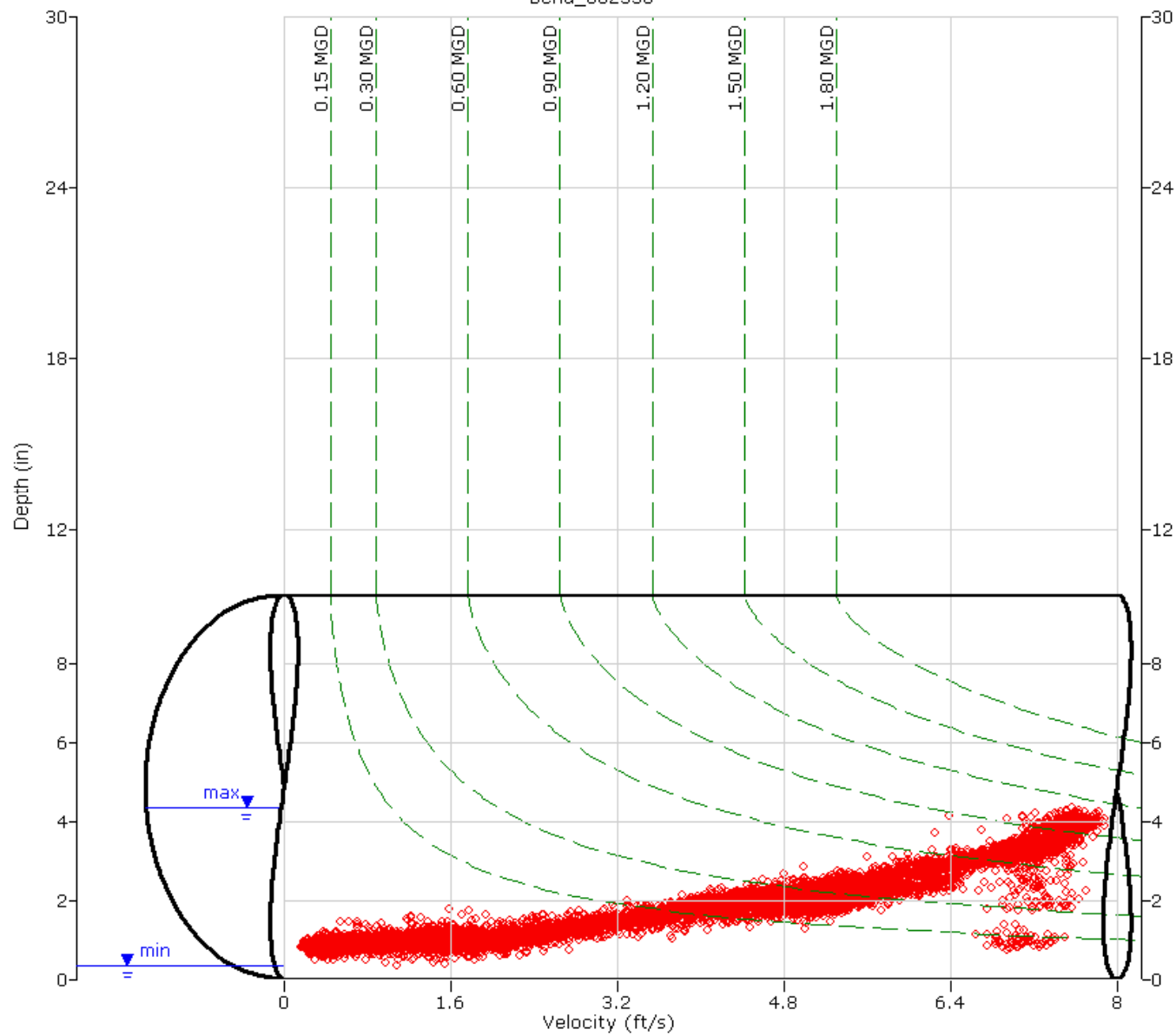
Pipe Height  
9.75 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_002538

## Flow Monitor

Bend\_002538

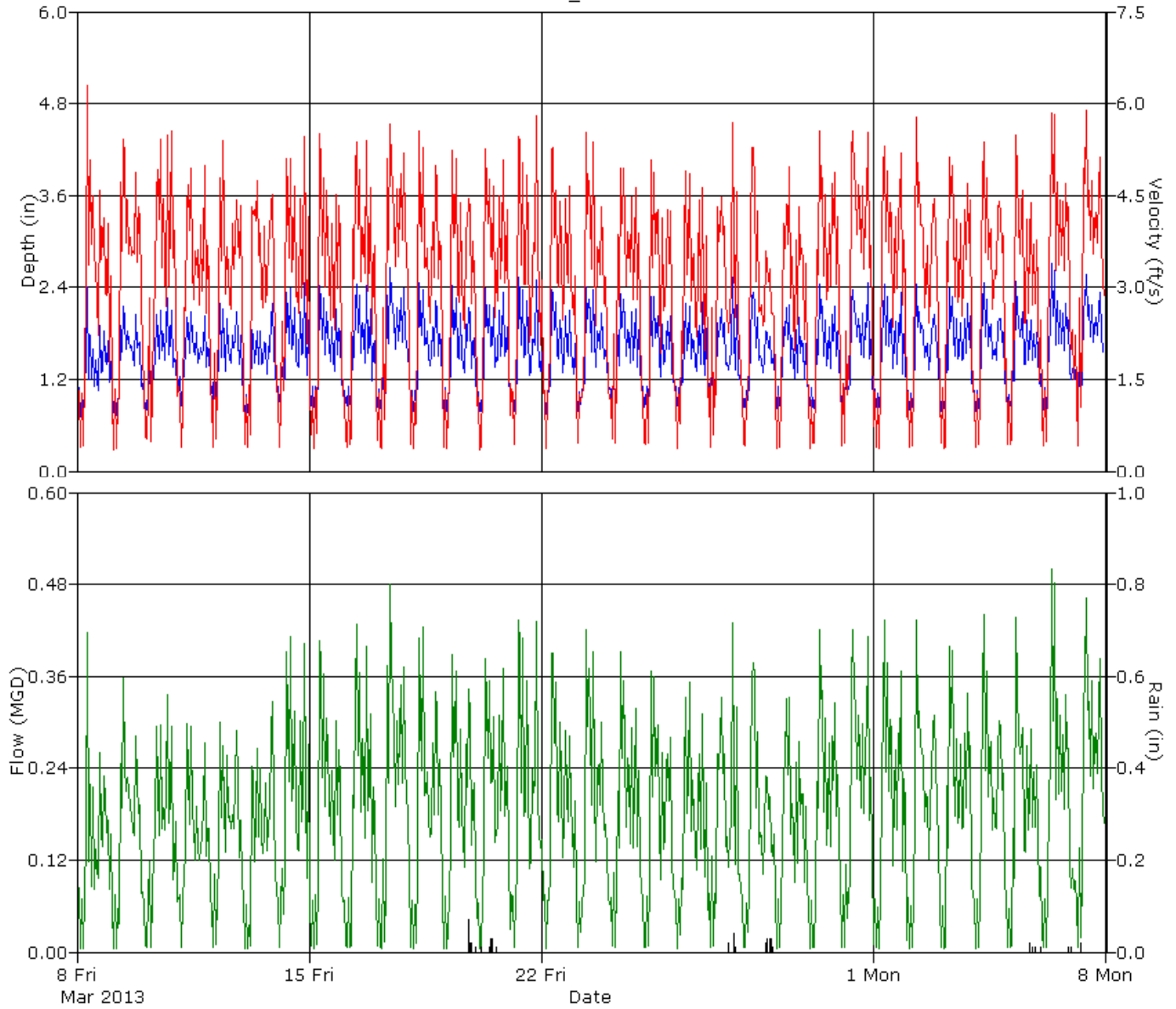
Pipe Height  
9.75 in.

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_002662	
Measured Pipe Height (in)	11.88
Nominal Pipe Height (in)	12
Silt Level (in)	0.25

### Overview

Monitoring point Bend\_002662 was located in the Northeast of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	5.69	0.81	0.199
Minimum	4.03	0.18	0.029
Maximum	7.67	1.54	0.512
Time of Minimum	3/8/2013 3:20 AM	3/12/2013 4:15 AM	3/12/2013 4:15 AM
Time of Maximum	3/17/2013 10:30 AM	3/17/2013 10:25 AM	3/17/2013 10:30 AM

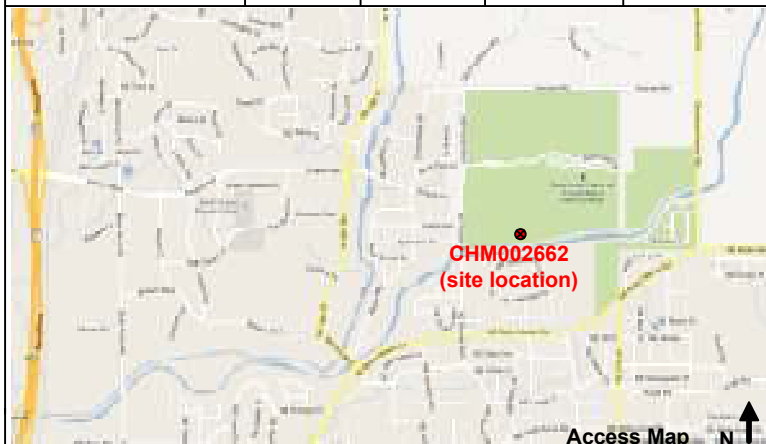
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_002662		Monitor Series: 5000 AG		Monitor S/N: 21481	
Address/Location: South of Yeoman Rd in Frisbee golf course near North Canal		Manhole #		CMH002662	
		Coordinates:		44°05'15.66"N 121°16'12.68"W	
		Pipe Height:		11.88"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 11.88"
					IP Address: 166.219.172.32



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/28/13 @ 14:47	Manhole Depth:	~ 10'
Site Hydraulics:	Smooth, laminar	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	Standing wave with 3 inputs	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Did not investigate	Telephone Information:	Doesn't apply
Depth of Flow:	5.37" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	6.51" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	0.85 fps	Road Cut Length:	Doesn't apply Feet
Silt:	1.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Cross Section</p>	<p>Planar</p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_JRRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_002662 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

<input checked="" type="checkbox"/>	This worksite does NOT require a traffic control Plan
<input type="checkbox"/>	Standard Traffic Control Plan is to be used at this work site
<input type="checkbox"/>	This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich  
 Signature: Signed copy can be obtained from ADS  
 Date: 2/28/13

#### Reviewed

Project Mgr Name: Mike Pina  
 Signature: Signed copy can be obtained from ADS  
 Date: 2/28/13



Bend\_002662

Site location

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Site access

Site access looking southwest



Bend\_002662

Site set up

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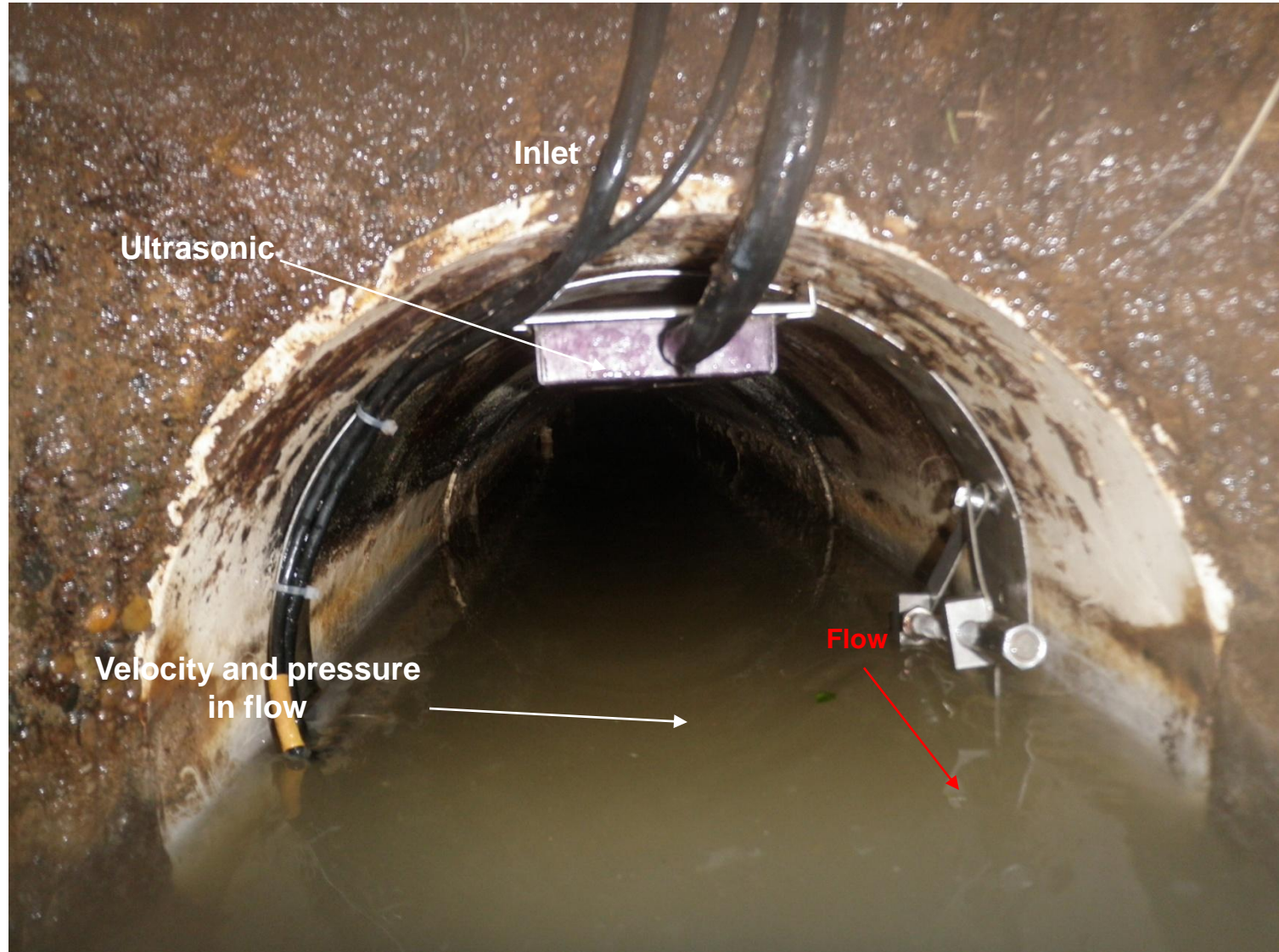
View down manhole facing north



Bend\_002662

Site set up

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View of sensor placement and site hydraulics



Bend\_002662

Site outlet

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View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_002662

## Flow Monitor

Bend\_002662

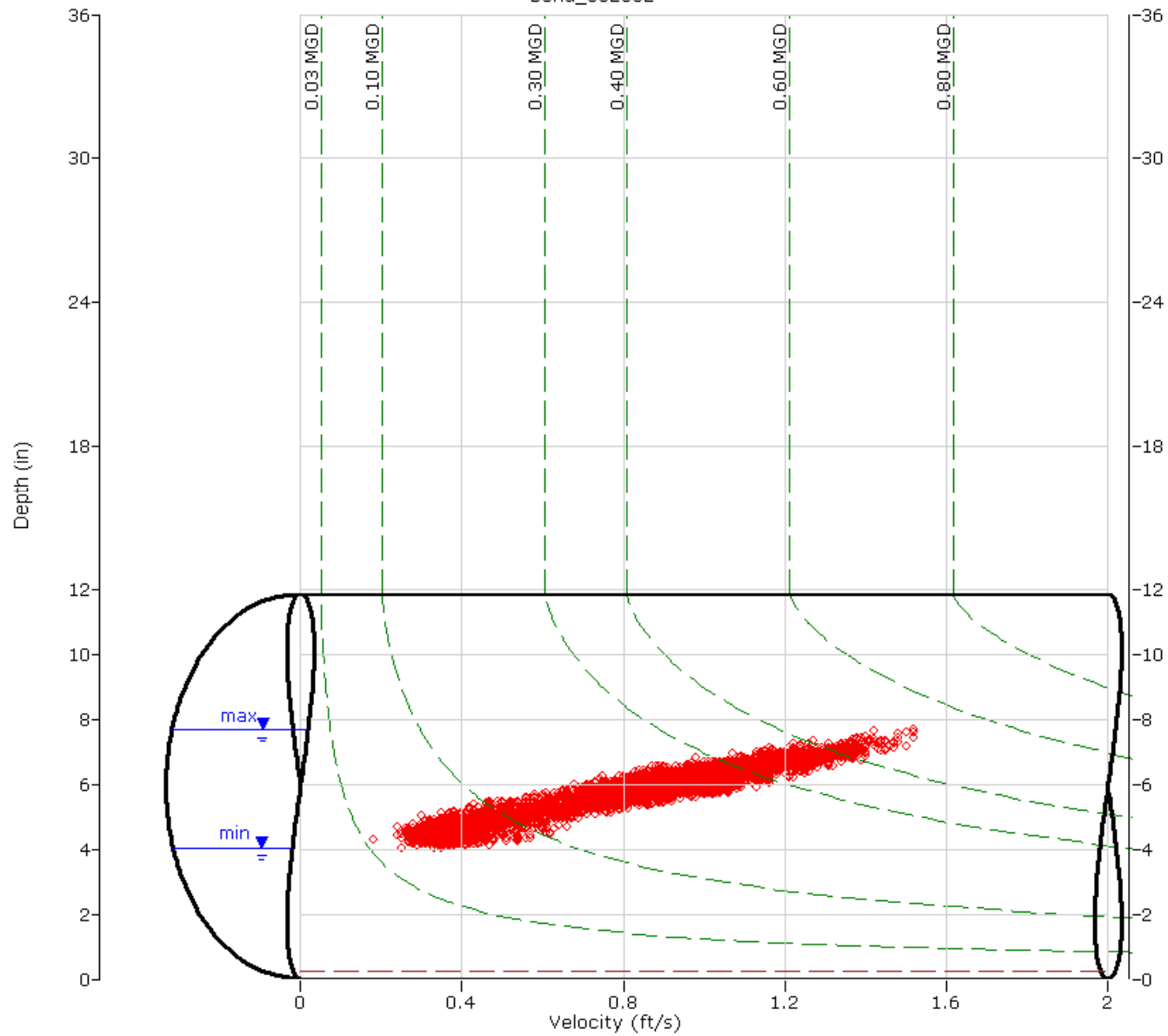
Pipe Height  
11.88 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_002662

## Flow Monitor

Bend\_002662

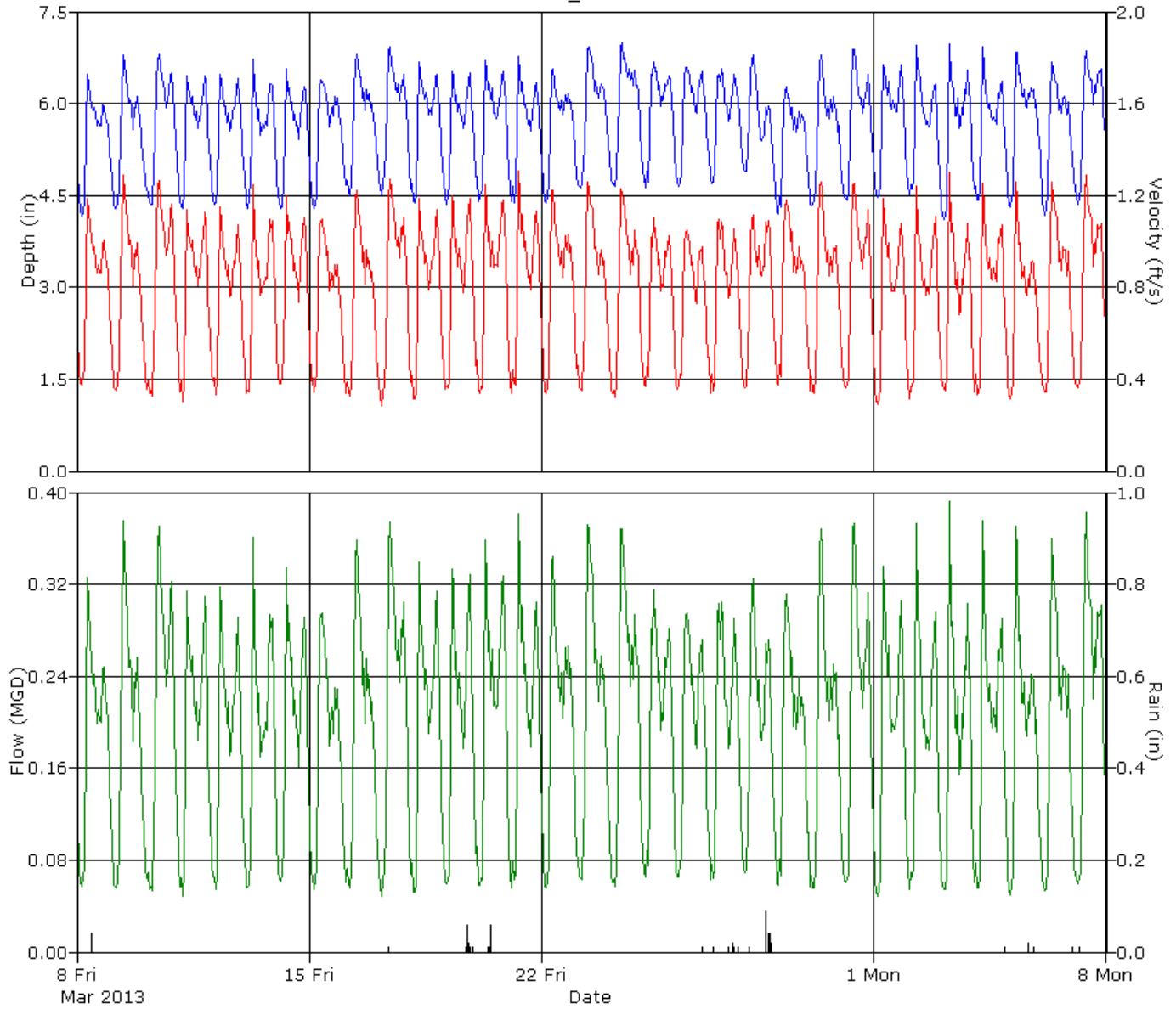
Pipe Height  
11.88 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_002683	
Measured Pipe Height (in)	8
Nominal Pipe Height (in)	8
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_002683 was located in the West of Bend (see attached site report for details).

The hydrograph indicates a diurnal flow pattern with a significant lift station influence during the period Friday, March 8, 2013 to Sunday, April 07, 2013. In order to try and best capture the lift station peaks, the sample rate was set to 2-minute. The scattergraph for this location indicates a fairly repeatable data set with some scatter attributed to the pump station influence. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 8%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 2-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.44	2.38	0.141
Minimum	0.06	0.00	0.000
Maximum	5.59	6.61	1.080
Time of Minimum	3/9/2013 3:36 PM	3/20/2013 1:34 AM	3/9/2013 1:38 AM
Time of Maximum	3/19/2013 4:40 PM	3/8/2013 10:26 PM	3/19/2013 4:40 PM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 2-minute data points divided by the total number of 2-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_002683		Monitor Series: 5000 AG		Monitor S/N: 21485	
Address/Location: West of Mt. Washington Dr. on Shevlin Park Rd.		Manhole #		CMH002683	
		Coordinates:		44° 4'5.77"N 121°21'22.77"W	
		Pipe Height:		8.00"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 8.00"
					IP Address: 166.219.172.7



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/20/2013 @ 14:14	Manhole Depth:	~ 5'
Site Hydraulics:	Flow varies, moderate to fast with ripples	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	Multiple L/S (varied distances)	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	90 degree bend in line	Telephone Information:	Doesn't apply
Depth of Flow:	0.75" +/- 0.38"	Access Pole #:	Doesn't apply
Range (Air DOF):	7.25" +/- 0.38"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.81 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Cross Section</p>	<p>Planar</p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultrasonic, Velocity, Pressure	Lift / Pump Station		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Force main input ~10' D/S
Surcharge Height:	None observed	WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	Bend_RWRG	Other		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Restriction in MH

Additional Site Information / Comments:	
5 PSI pressure used at this location	



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_002683 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☒ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/20/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/20/13



Bend\_002683

Site location

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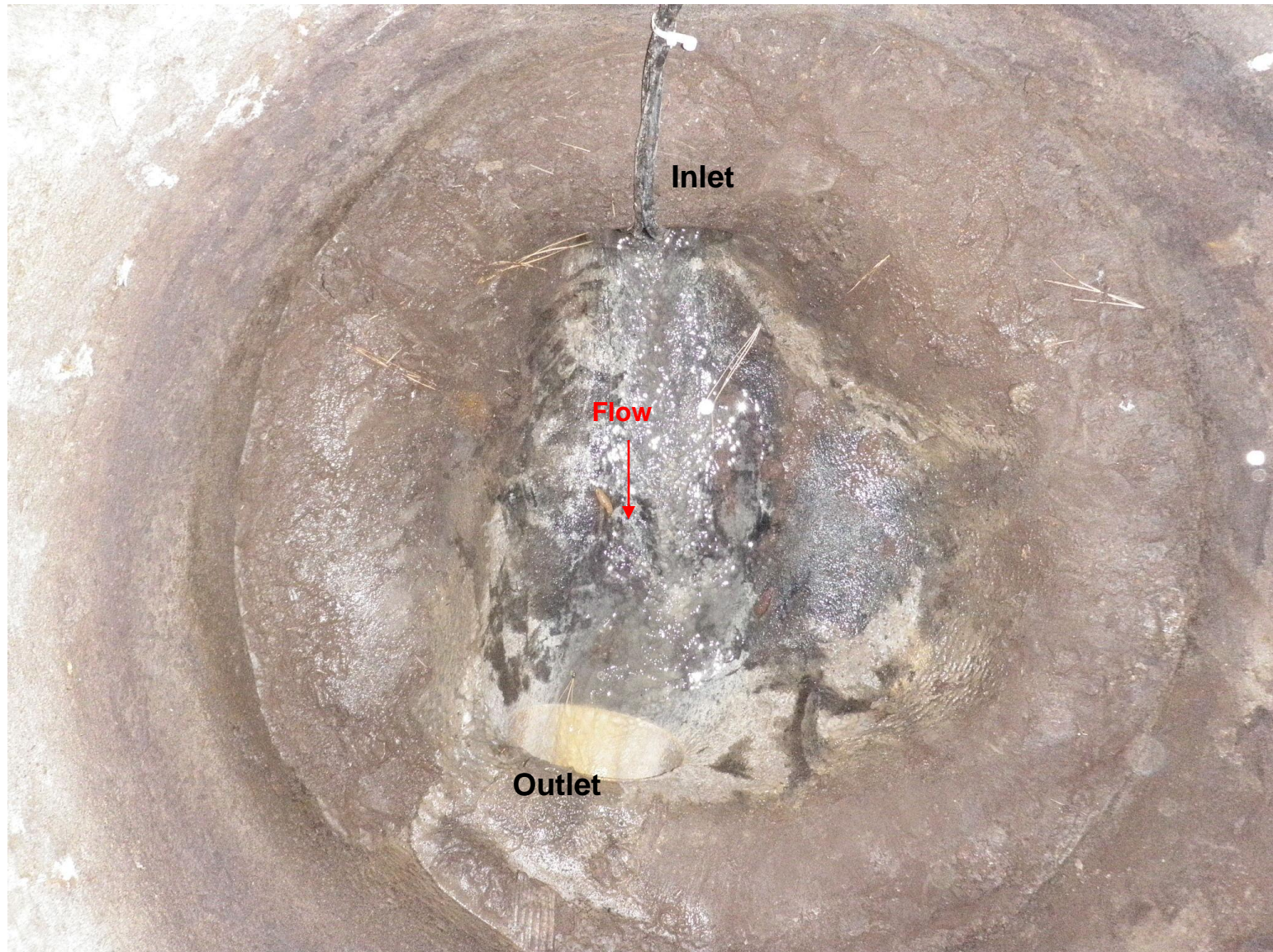
Site access looking north



Bend\_002683

Site set up

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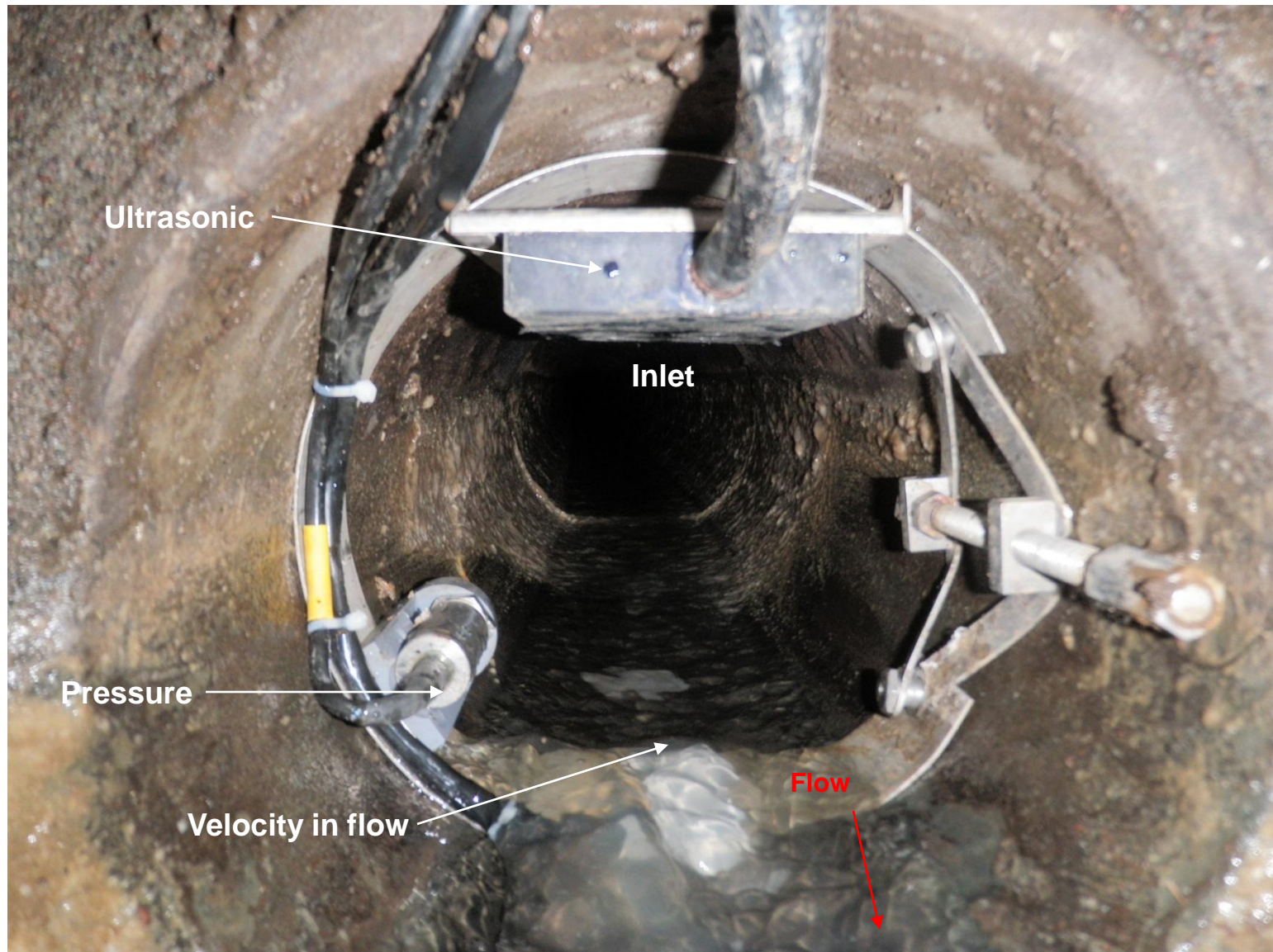
View down manhole facing north



Bend\_002683

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



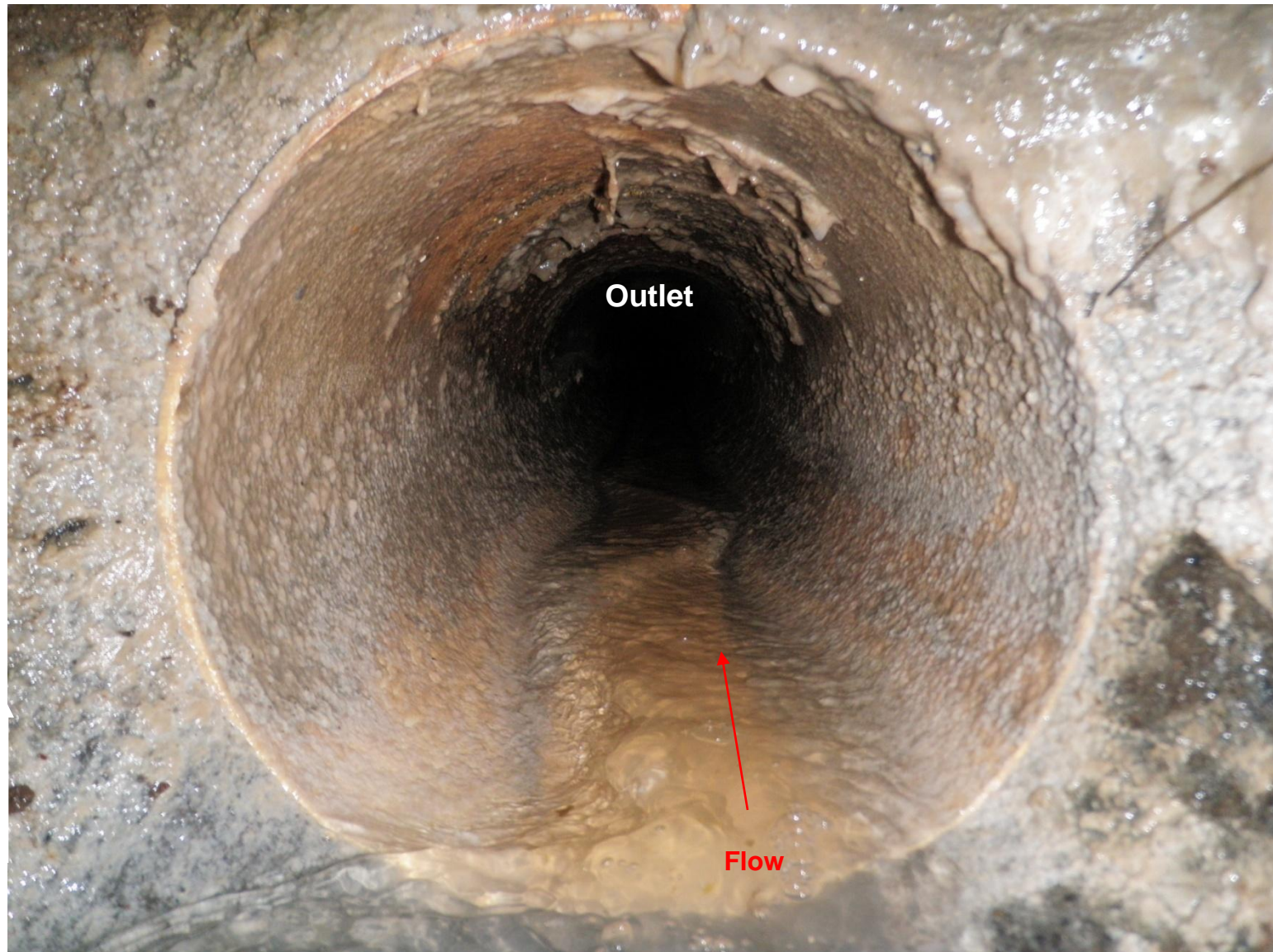
**View of sensor placement and site hydraulics**



Bend\_002683

Site outlet

**ADS ENVIRONMENTAL  
SERVICES®**



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_002683

## Flow Monitor

Bend\_002683

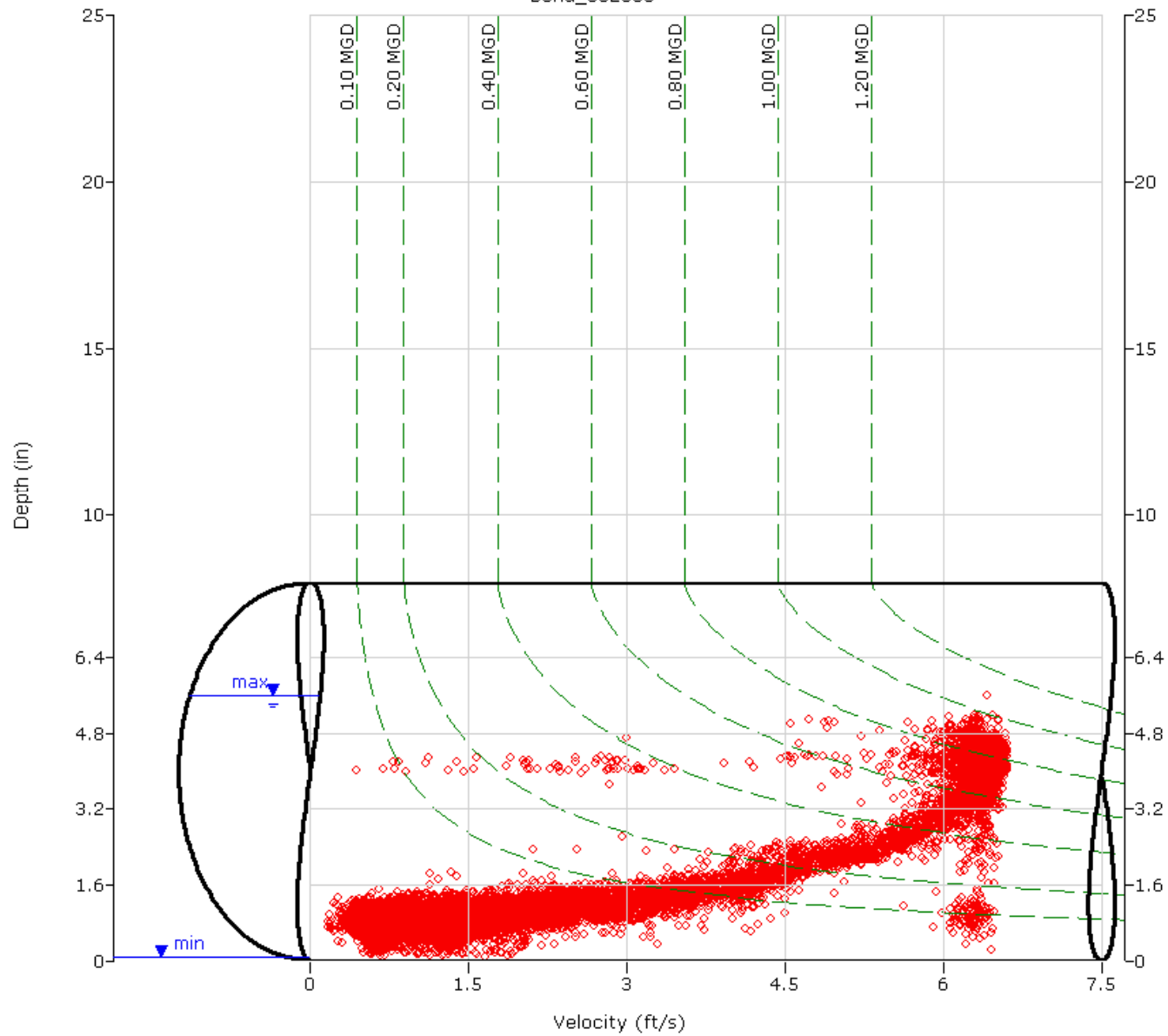
Pipe Height  
8.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- Iso-Q™
- Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_002683

## Flow Monitor

Bend\_002683

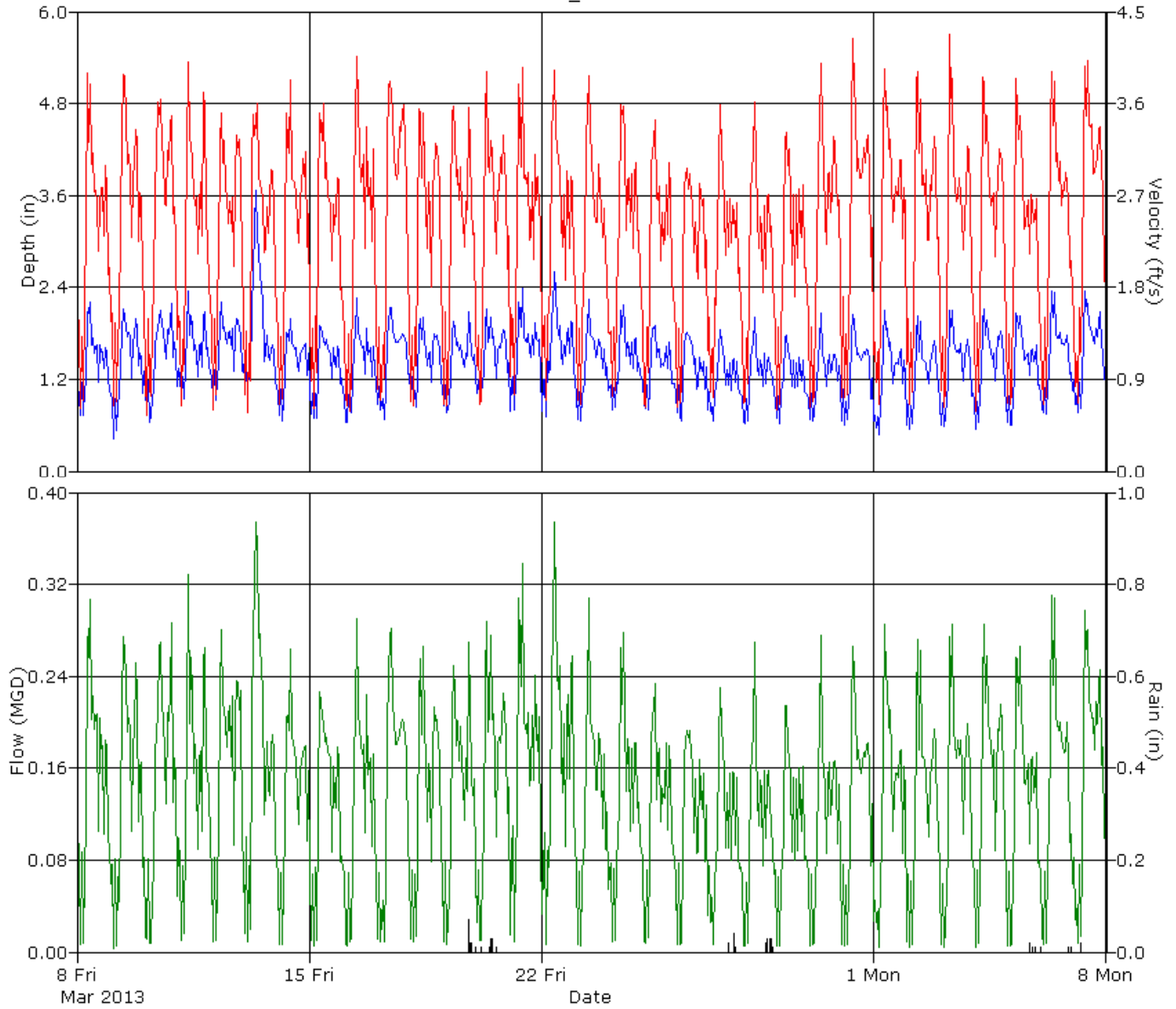
Pipe Height  
8.00 in.

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_002786	
Measured Pipe Height (in)	12.13
Nominal Pipe Height (in)	12
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_002786 was located in the East of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern with occasional discharge spikes during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with a backwater condition developing at depths greater than 5.5". The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.99	1.45	0.154
Minimum	1.43	0.63	0.025
Maximum	6.10	2.32	0.534
Time of Minimum	4/2/2013 4:30 AM	3/9/2013 3:15 AM	4/2/2013 4:30 AM
Time of Maximum	3/24/2013 10:20 AM	4/6/2013 11:00 AM	3/24/2013 10:20 AM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_002786		Monitor Series: 5000 AG		Monitor S/N: 21442	
Address/Location: 1223 NE Burnside Ave		Manhole #		CMH002786	
		Coordinates:		44°03'06.08"N 121°17'19.35"W	
		Pipe Height:		12.13"	
Access: Drive		Type of System:		Pipe Width: 12.13"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.172.34	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/27/13 @ 17:03	Manhole Depth:	~10'
Site Hydraulics:	Small waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	No Influence	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Small waves	Telephone Information:	Doesn't apply
Depth of Flow:	3.00" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	9.13" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.60 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultrasonic, Velocity, Pressure	Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height:	None observed	WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	Bend_RWRG	Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:	
5 PSI pressure used at this location	



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_002786 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/27/13

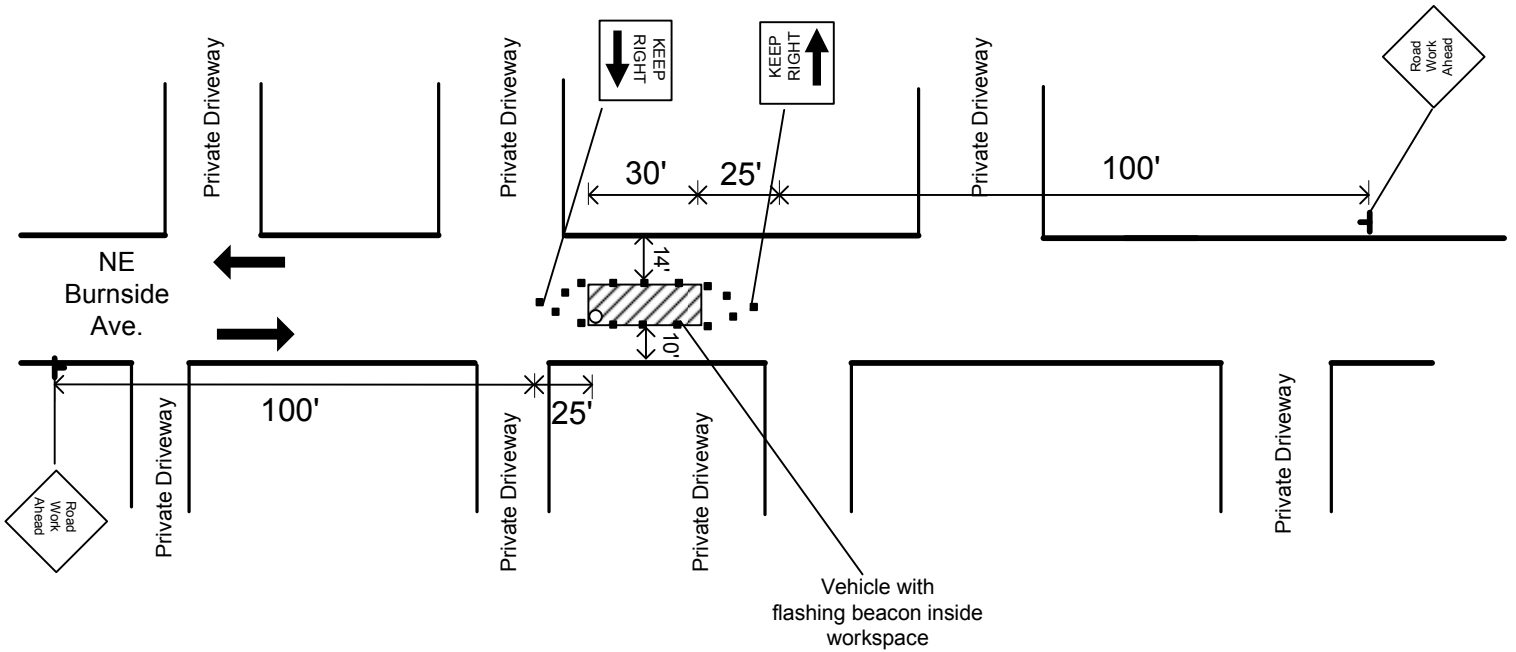
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/27/13





Posted Speed Limit

SPEED  
 LIMIT  
**25**

Office (206) 762-5070  
 Fax (206) 762-5077  
 24 hour contact  
 Daniel Sinkovich  
 (206) 255-4464

**Site Access**  
 02/27/13-04/13/13  
 7:00am-4:00pm



Bend\_002786

Site location

**ADS ENVIRONMENTAL  
SERVICES®**



Site access looking northeast



Bend\_002786

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



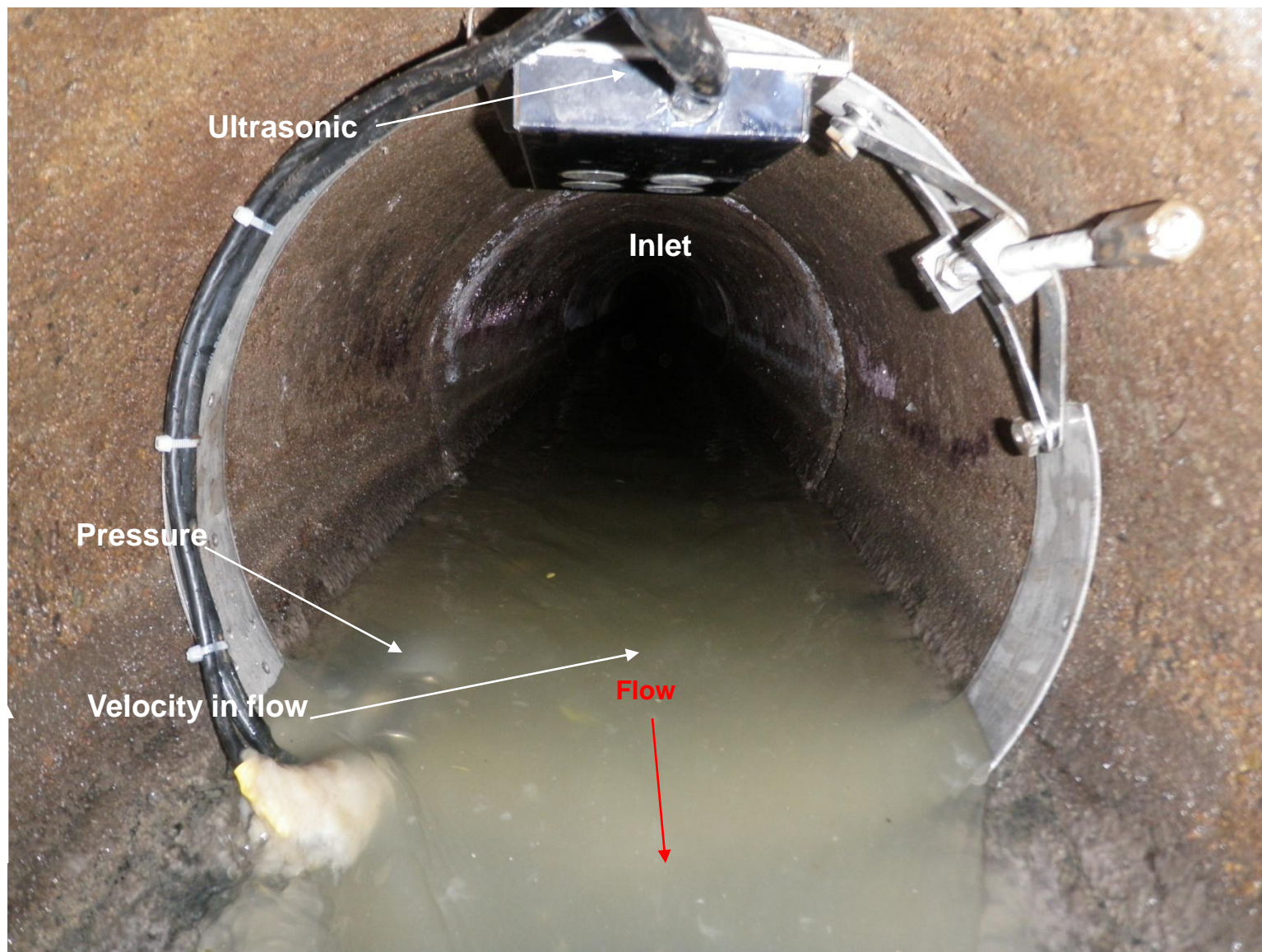
View down manhole facing northeast



Bend\_002786

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of sensor placement and site hydraulics



Bend\_002786

Site outlet

**ADS ENVIRONMENTAL  
SERVICES®**



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_002786

## Flow Monitor

Bend\_002786

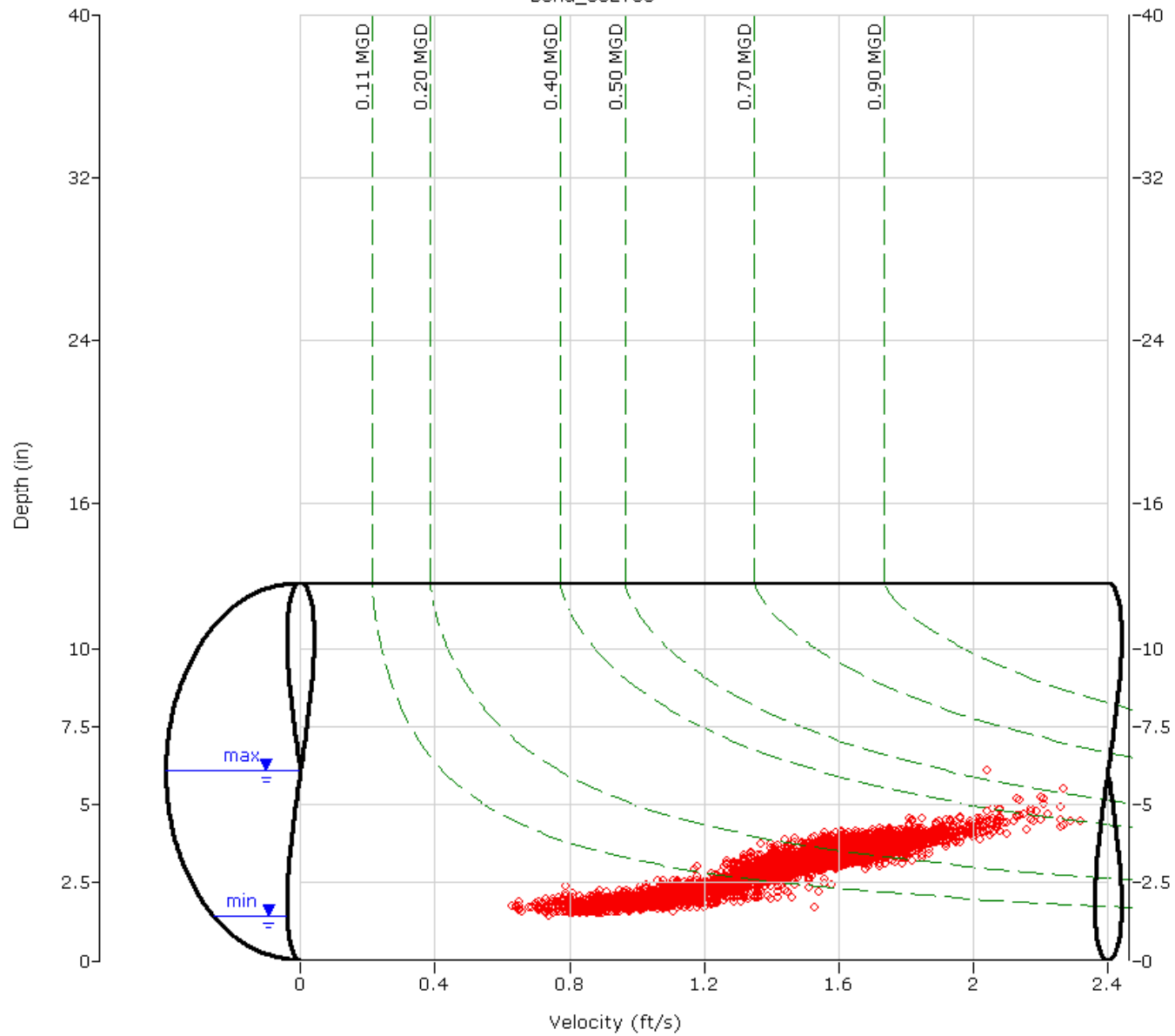
Pipe Height  
12.13 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_002786

## Flow Monitor

Bend\_002786

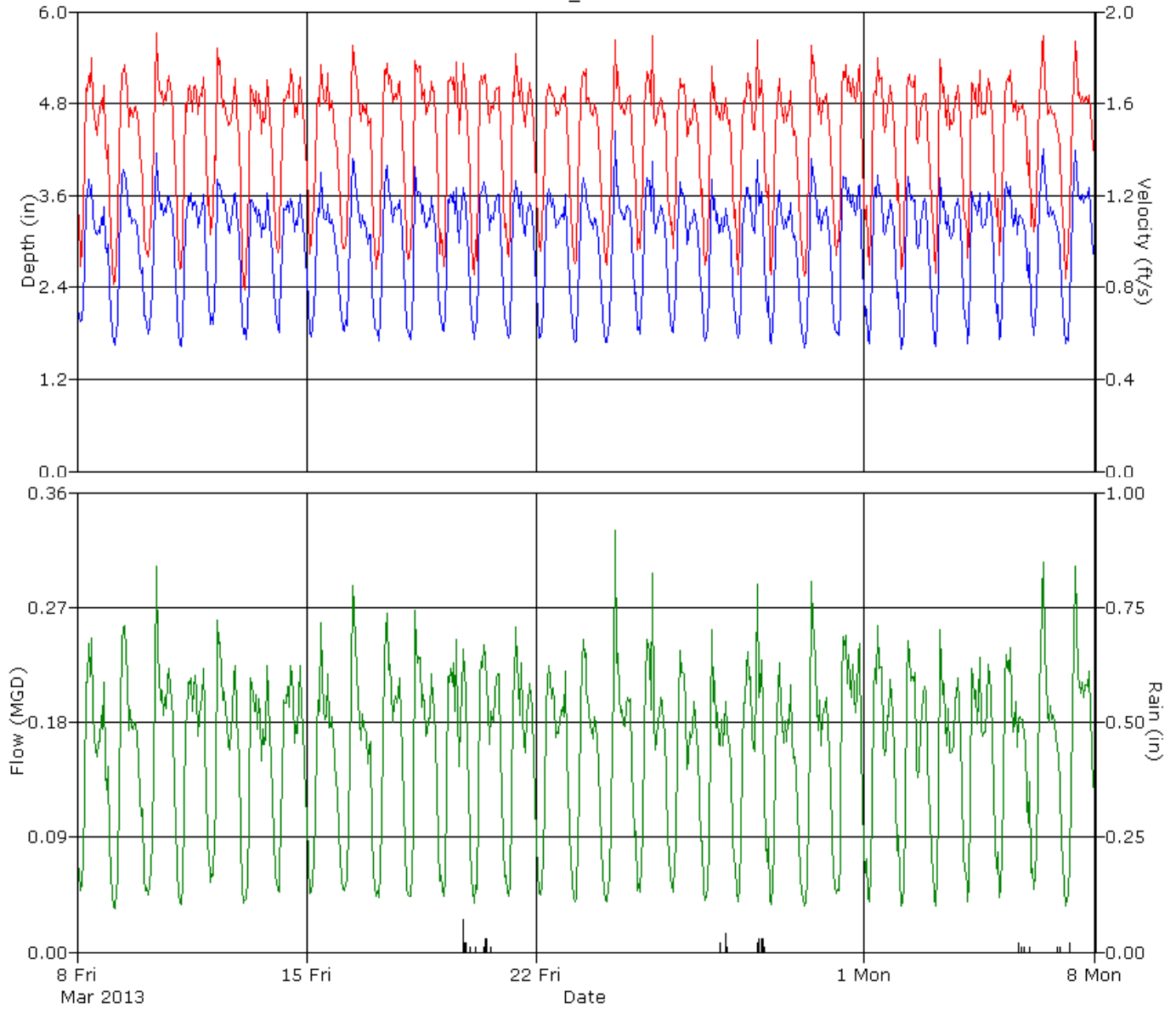
Pipe Height  
12.13 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_002803	
Measured Pipe Height (in)	12
Nominal Pipe Height (in)	12
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_002803 was located in the South of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.53	1.21	0.101
Minimum	1.09	0.36	0.012
Maximum	3.72	1.76	0.217
Time of Minimum	3/31/2013 3:50 AM	3/31/2013 3:10 AM	3/31/2013 3:10 AM
Time of Maximum	3/16/2013 12:20 PM	3/30/2013 1:00 PM	3/16/2013 12:20 PM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_002803		Monitor Series: 5000 AG		Monitor S/N: 20967	
Address/Location: SE 3 <sup>rd</sup> St & HWY 97		Manhole #		CMH002803	
		Coordinates:		44°02'56.96"N 121°18'08.16"W	
		Pipe Height:		12.00"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 12.00"
					IP Address: 166.219.172.57



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	3/5/13 @ 10:39	Manhole Depth:	~ 12'
Site Hydraulics:	Small waves and moderate flow	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	On a bend, waves	Mini System Character:	Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Did not investigate	Telephone Information:	Doesn't apply
Depth of Flow:	3.13" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	7.38" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.72 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_002803 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input checked="" type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only.  
Site is located near an intersection. Follow proper traffic control plan procedures

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 3/5/13

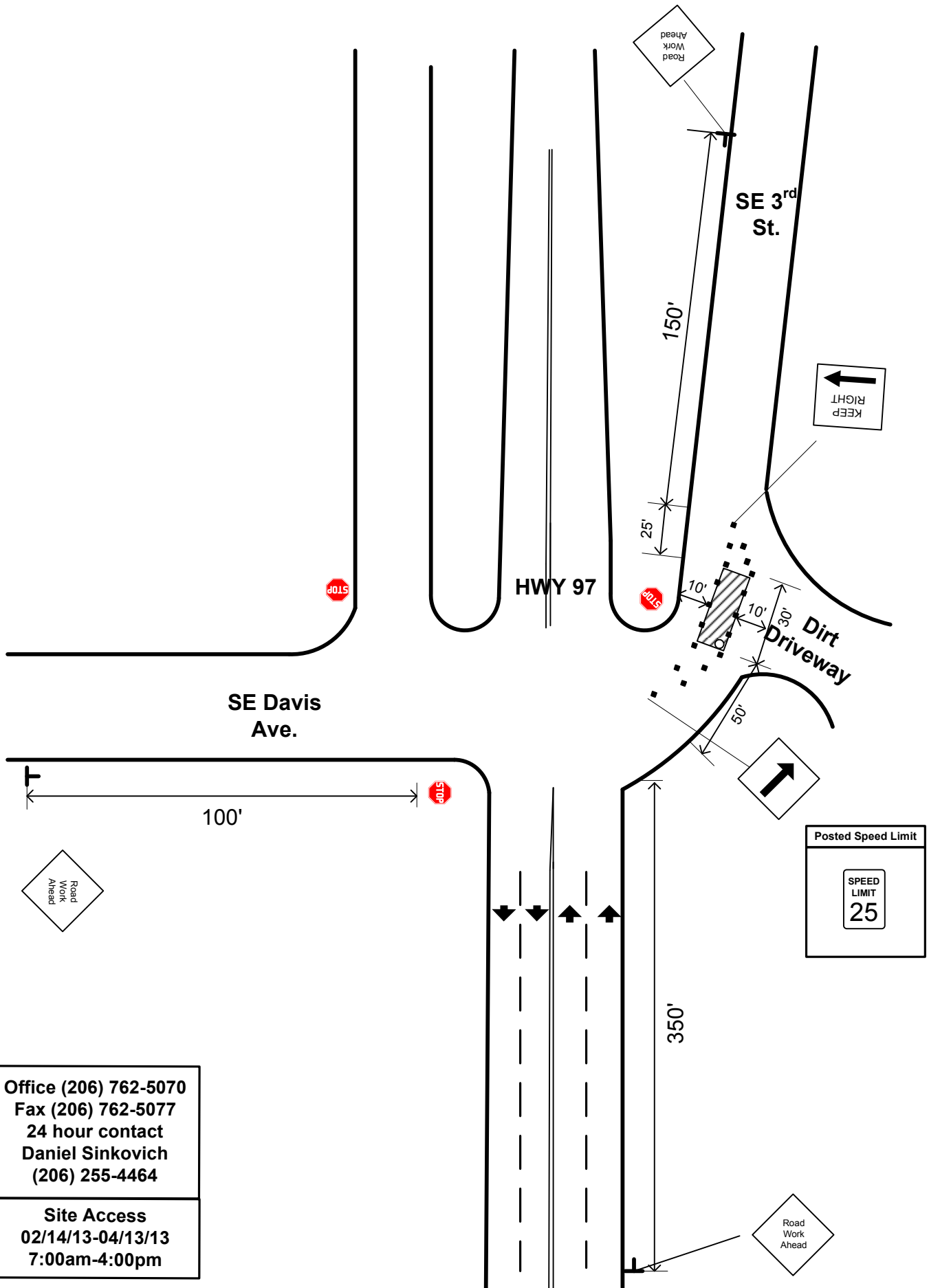
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 3/5/13





Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

Site Access  
02/14/13-04/13/13  
7:00am-4:00pm



Bend\_002803

Site Access

**ADS ENVIRONMENTAL  
SERVICES®**



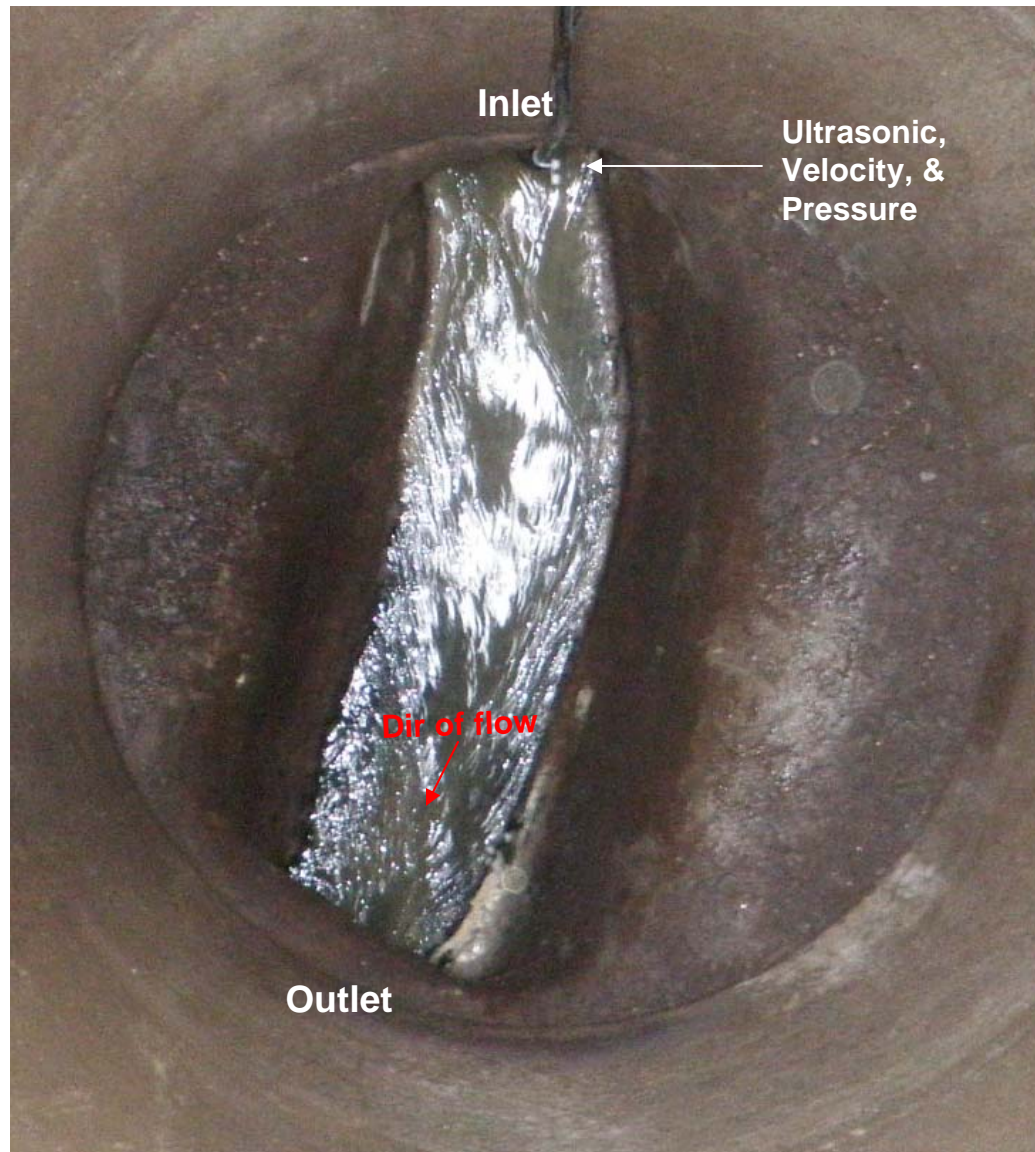
Site access looking north



Bend\_002803

Site set up

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SERVICES®**



View of site looking north



Bend\_002803

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



**View of inlet and sensors**



Bend\_002803

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of outlet



# SCATTERGRAPH REPORT

Bend\_002803

## Flow Monitor

Bend\_002803

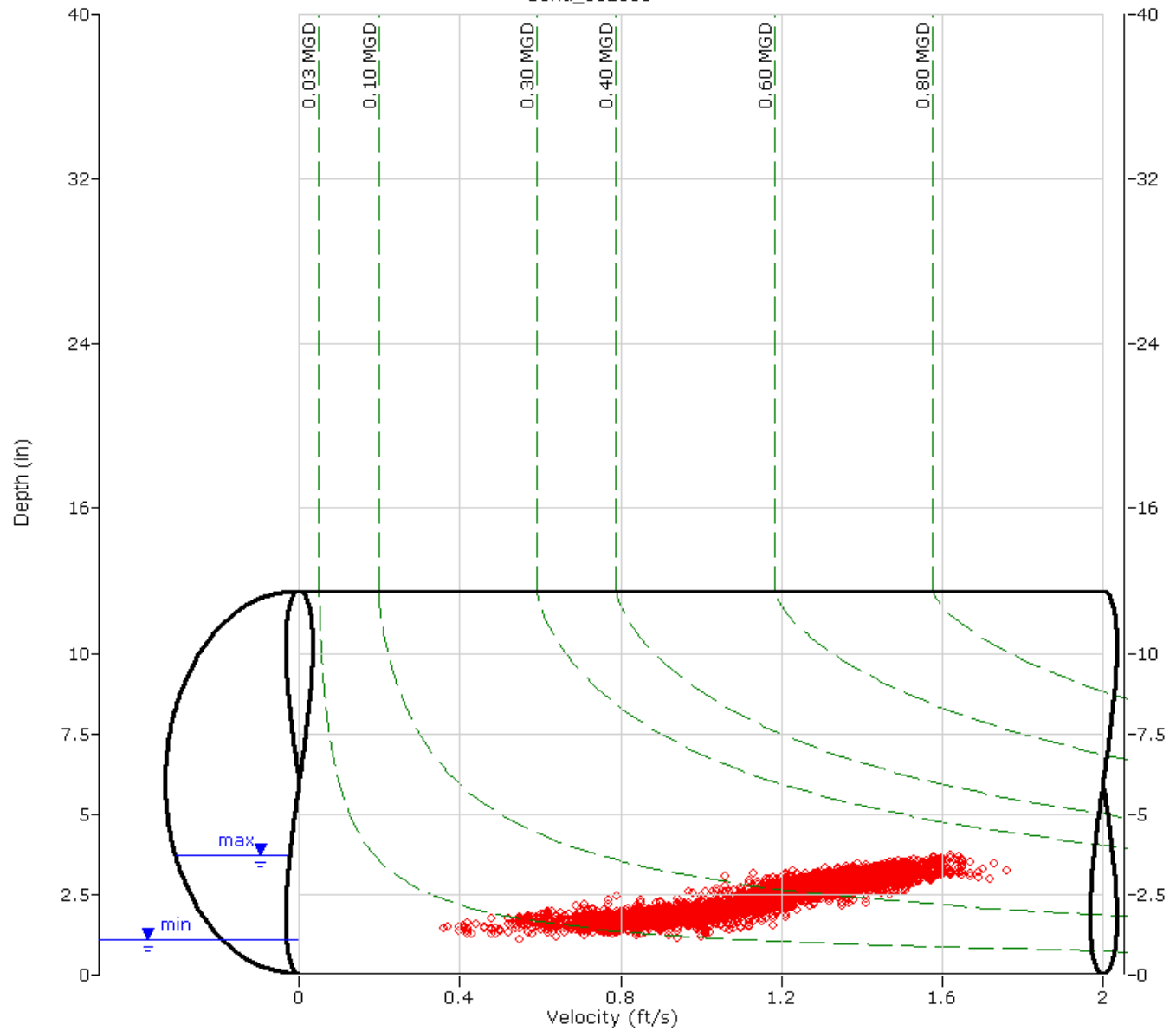
Pipe Height  
12.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_002803

## Flow Monitor

Bend\_002803

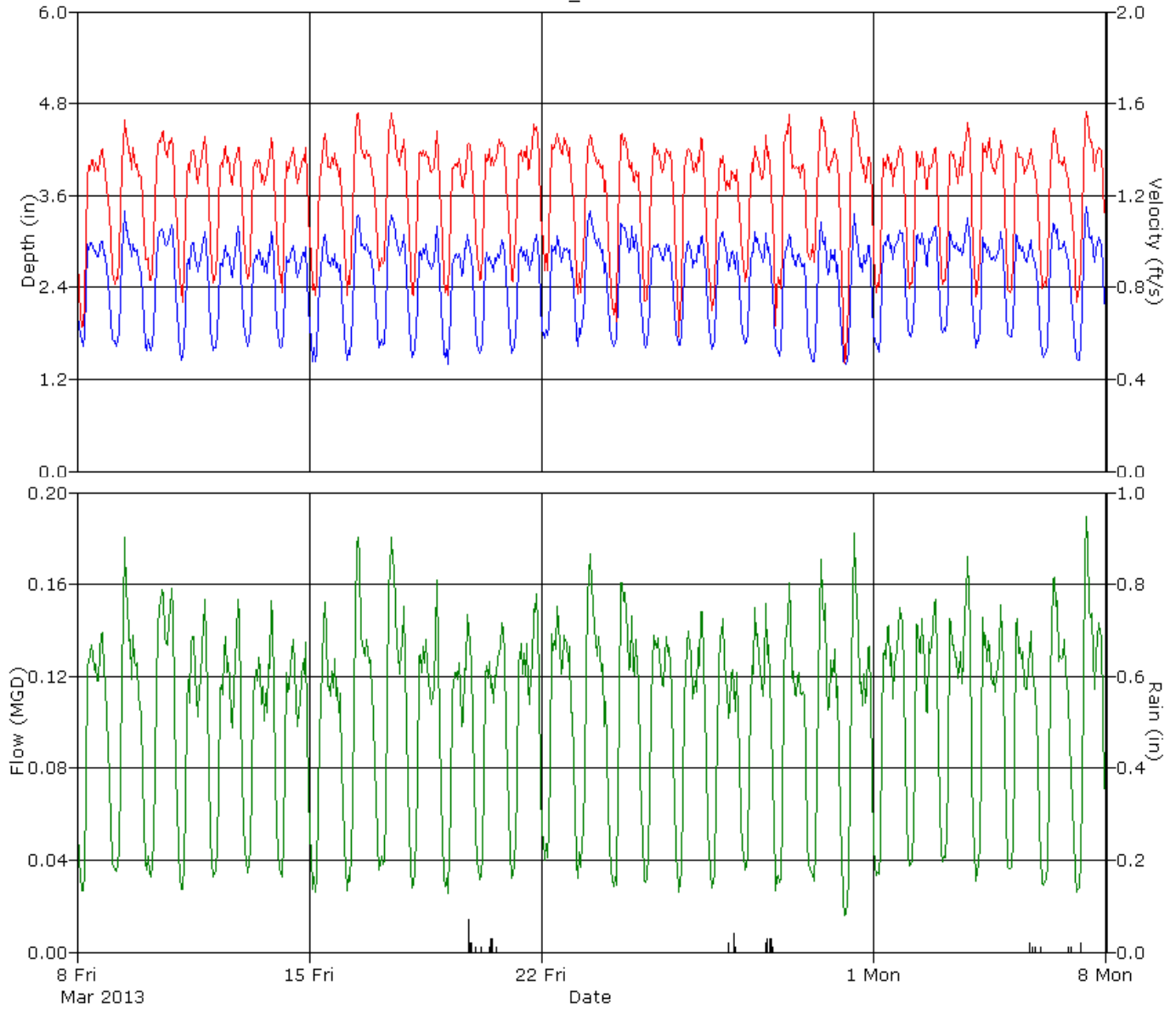
Pipe Height  
12.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_002955	
Measured Pipe Height (in)	17.5
Nominal Pipe Height (in)	18
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_002955 was located in the Southwest of Bend (see attached site report for details).

The hydrograph indicates a commercial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set, with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	5.96	1.54	0.551
Minimum	2.71	0.44	0.059
Maximum	11.76	2.51	1.715
Time of Minimum	3/13/2013 4:58 AM	4/6/2013 6:04 AM	4/6/2013 4:32 AM
Time of Maximum	3/9/2013 9:52 AM	3/8/2013 6:46 AM	3/9/2013 9:52 AM

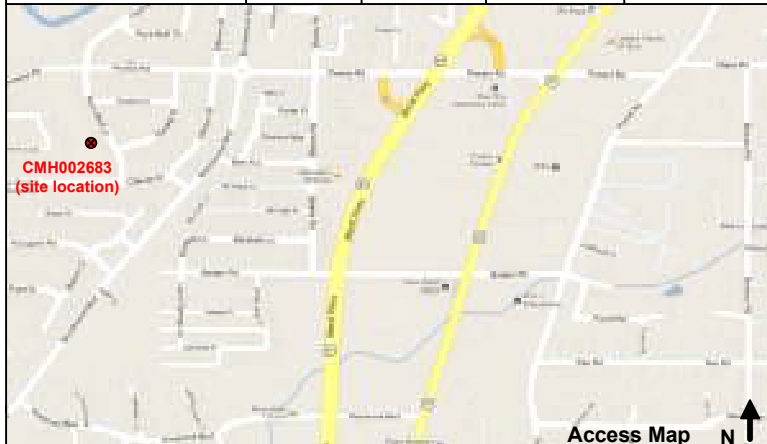
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_002955		Monitor Series: 5000 AG		Monitor S/N: 20031	
Address/Location: 20130 Badger Rd.		Manhole #		CMH002955	
		Coordinates:		44° 1'27.63"N 121°19'2.22"W	
		Pipe Height:		17.50"	
Access: Drive		Type of System:		Pipe Width: 17.75"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.172.69	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/23/2013 @ 16:48	Manhole Depth:	~ 14'
Site Hydraulics:	Small waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	L/S	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	Waves	Telephone Information:	Doesn't apply
Depth of Flow:	8.63" +/- 0.38"	Access Pole #:	Doesn't apply
Range (Air DOF):	9.88" +/- 0.38"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.89 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Cross Section</p>	<p>Planar</p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
---

5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_002955 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☒ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/23/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/23/13



Bend\_002955

Site location

**ADS ENVIRONMENTAL  
SERVICES®**



Site access

Site access looking north



Bend\_002955

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



View down manhole facing south



Bend\_002955

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of sensor placement and site hydraulics



Bend\_002955

Site outlet

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_002955

## Flow Monitor

Bend\_002955

Pipe Height  
17.50 in

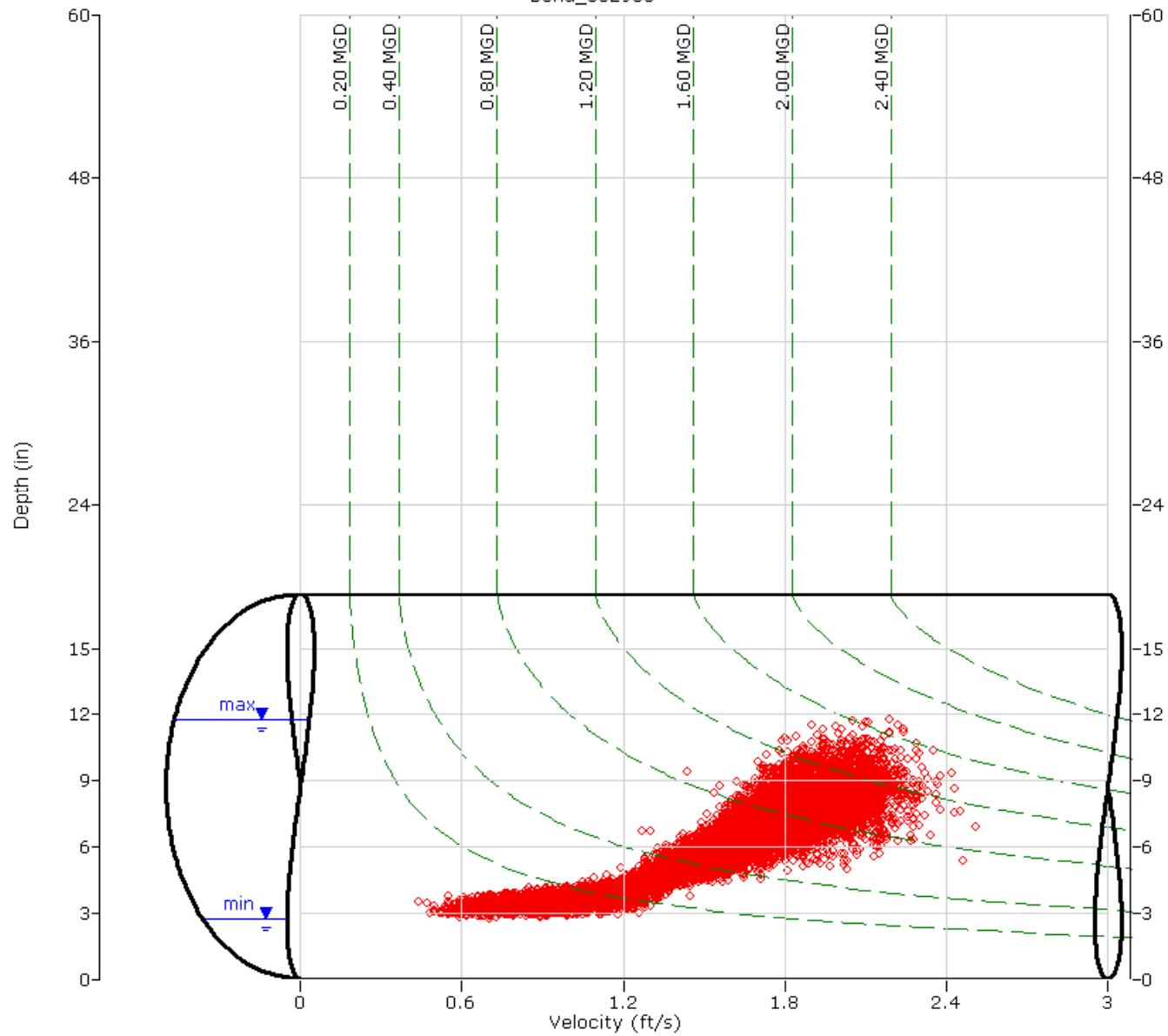
## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth

AGS ENVIRONMENTAL  
SERVICES





# HYDROGRAPH REPORT

Bend\_002955

## Flow Monitor

Bend\_002955

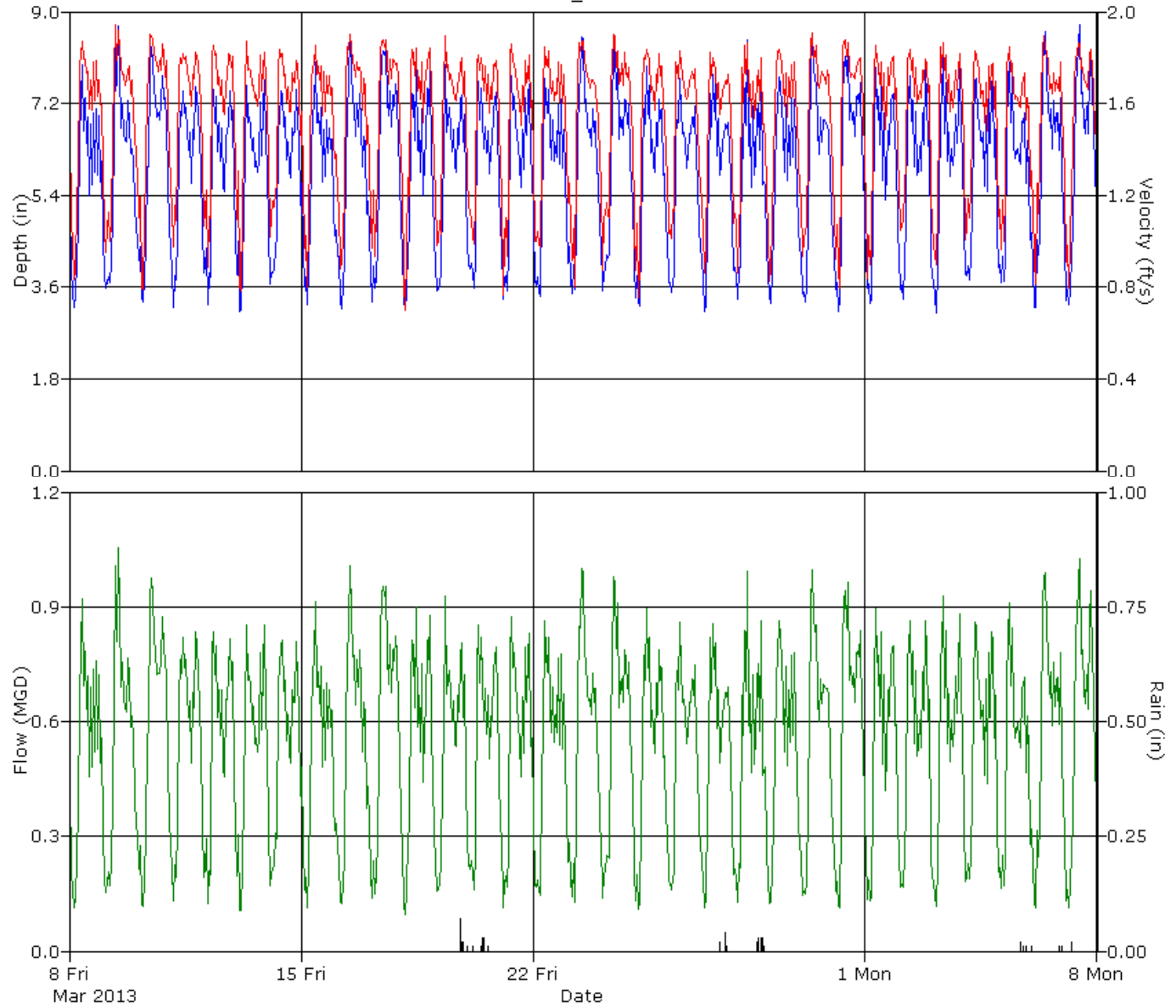
Pipe Height  
17.50 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

---

### Site Information

Bend_002971	
Measured Pipe Height (in)	14.5
Nominal Pipe Height (in)	15
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_002971 was located in the Southeast of Bend (see attached site report for details).

The hydrograph indicates a residential/commercial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a fairly repeatable data set, however a number of hydraulic shifts are present indicating shifting debris. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 8%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.05	0.63	0.042
Minimum	1.07	0.14	0.005
Maximum	3.56	1.53	0.168
Time of Minimum	3/22/2013 4:35 AM	3/26/2013 2:00 AM	3/26/2013 2:00 AM
Time of Maximum	3/27/2013 8:30 AM	3/11/2013 9:15 AM	3/11/2013 9:40 AM

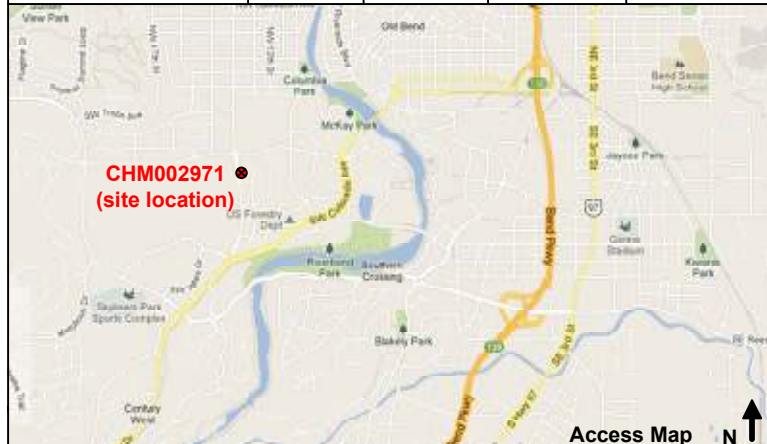
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_002971		Monitor Series: 5000 AG		Monitor S/N: 21540	
Address/Location: In parking spaces along SW Century Dr @ 302 SW Century Dr		Manhole #		CMH002971	
		Coordinates:		44°02'48.08"N 121°19'52.78"W	
		Pipe Height:		14.50"	
Access: Drive		Type of System:		Pipe Width: 14.50"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.172.50	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	3/5/13 @ 08:58	Manhole Depth:	~ 10'
Site Hydraulics:	Small waves and moderate flow	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	Bend in line	Mini System Character:	Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Did not investigate	Telephone Information:	Doesn't apply
Depth of Flow:	1.88" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	11.00" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	0.84 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.38"	Trench Length:	Doesn't apply Feet

Other Information:	

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_002971 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

<input checked="" type="checkbox"/>	This worksite does NOT require a traffic control Plan
<input type="checkbox"/>	Standard Traffic Control Plan is to be used at this work site
<input type="checkbox"/>	This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich  
 Signature: Signed copy can be obtained from ADS  
 Date: 3/5/13

#### Reviewed

Project Mgr Name: Mike Pina  
 Signature: Signed copy can be obtained from ADS  
 Date: 3/5/13



Bend\_002971

Site Access

**ADS ENVIRONMENTAL  
SERVICES®**



Site access looking north



Bend\_002971

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



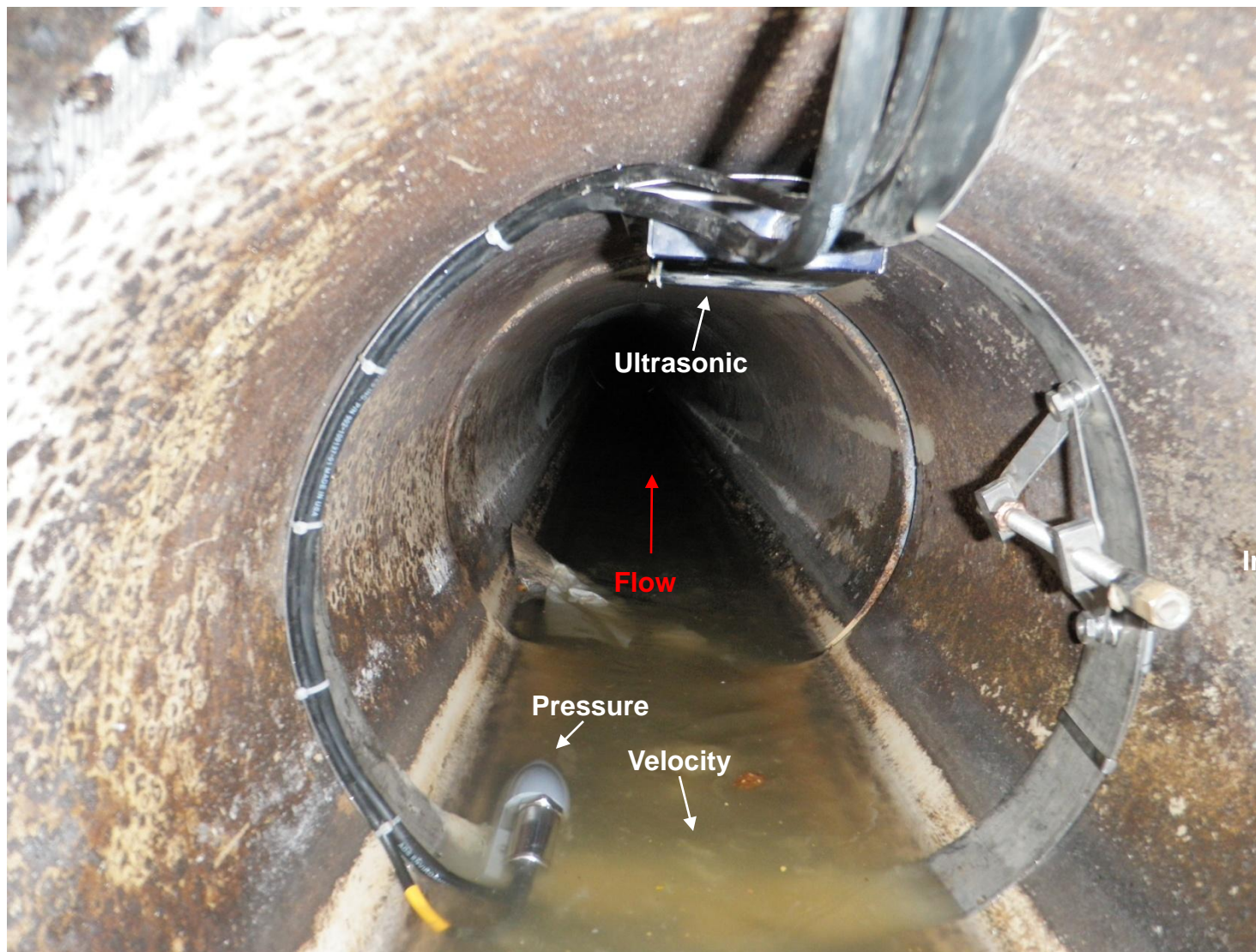
View of site looking north



Bend\_002971

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of inlet and sensors



Bend\_002971

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of outlet



# SCATTERGRAPH REPORT

Bend\_002971

## Flow Monitor

Bend\_002971

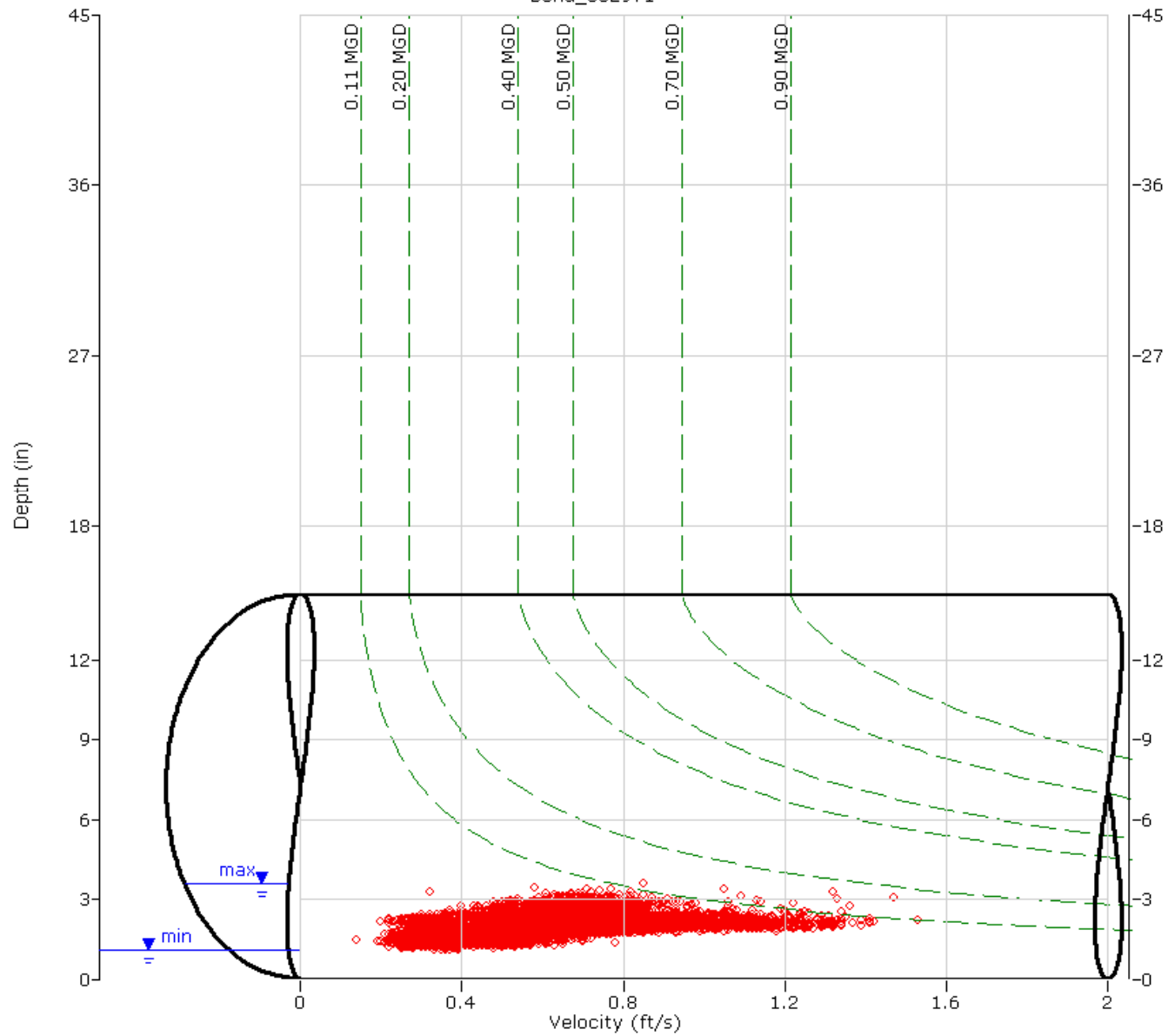
Pipe Height  
14.50 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_002971

## Flow Monitor

Bend\_002971

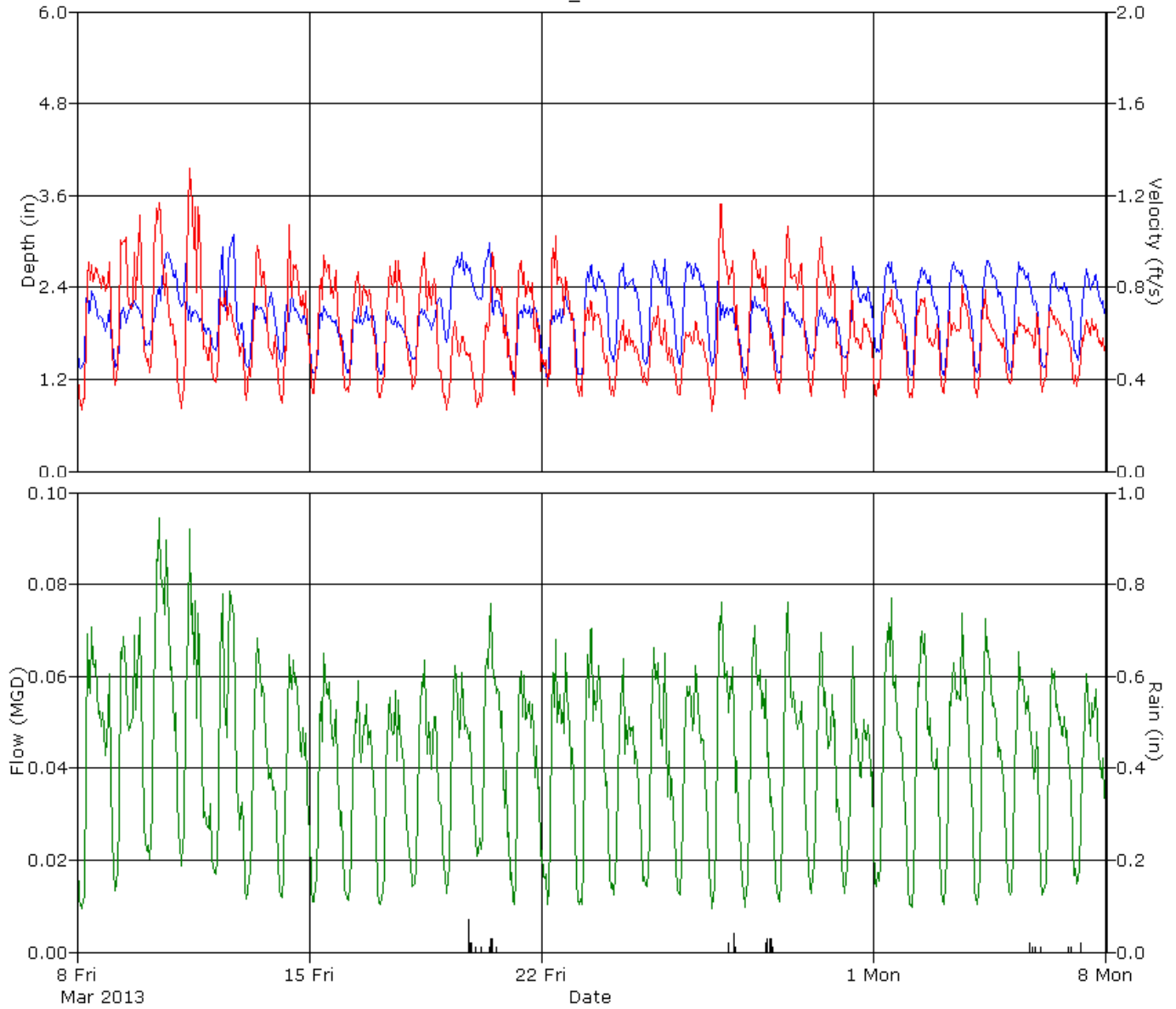
Pipe Height  
14.50 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_003151	
Measured Pipe Height (in)	7.75
Nominal Pipe Height (in)	8
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_003151 was located in the North of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern with lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with frequent surcharge conditions (depth exceeds crown of pipe) noted. The surcharge conditions necessitated the use of a pressure sensor to measure the depth at this location at depths close to or exceeding pipe height.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.30	1.48	0.156
Minimum	1.05	0.14	0.004
Maximum	13.28	3.63	0.771
Time of Minimum	4/1/2013 3:35 AM	3/25/2013 3:40 AM	3/25/2013 3:40 AM
Time of Maximum	3/9/2013 2:10 PM	4/6/2013 7:00 PM	3/30/2013 1:10 PM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_003151		Monitor Series: 5000 AG		Monitor S/N: 20665	
Address/Location: 63273 Nels Anderson Rd		Manhole #		CMH003151	
		Coordinates:		44° 5'51.75"N 121°17'51.84"W	
		Pipe Height:		7.75"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 7.88"
					IP Address: 166.219.172.62



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	3/6/2013 @ 16:08	Manhole Depth:	~ 12'
Site Hydraulics:	Frequent surcharge, otherwise steady wavy flow	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	Multiple L/S (~300', ~.5mi)	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	90 degree bend in line with two inlets	Telephone Information:	Doesn't apply
Depth of Flow:	2.75 +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	5.00" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.55 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard with ultrasonic on surcharge mount	Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultrasonic, Velocity, Pressure	Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height:	~1'	WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	Bend_JRRG	Other		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Restriction in CMH003150

Additional Site Information / Comments:
---

15 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_003151 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only.

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☒ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 3/6/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 3/6/13



Bend\_003151

Site Access

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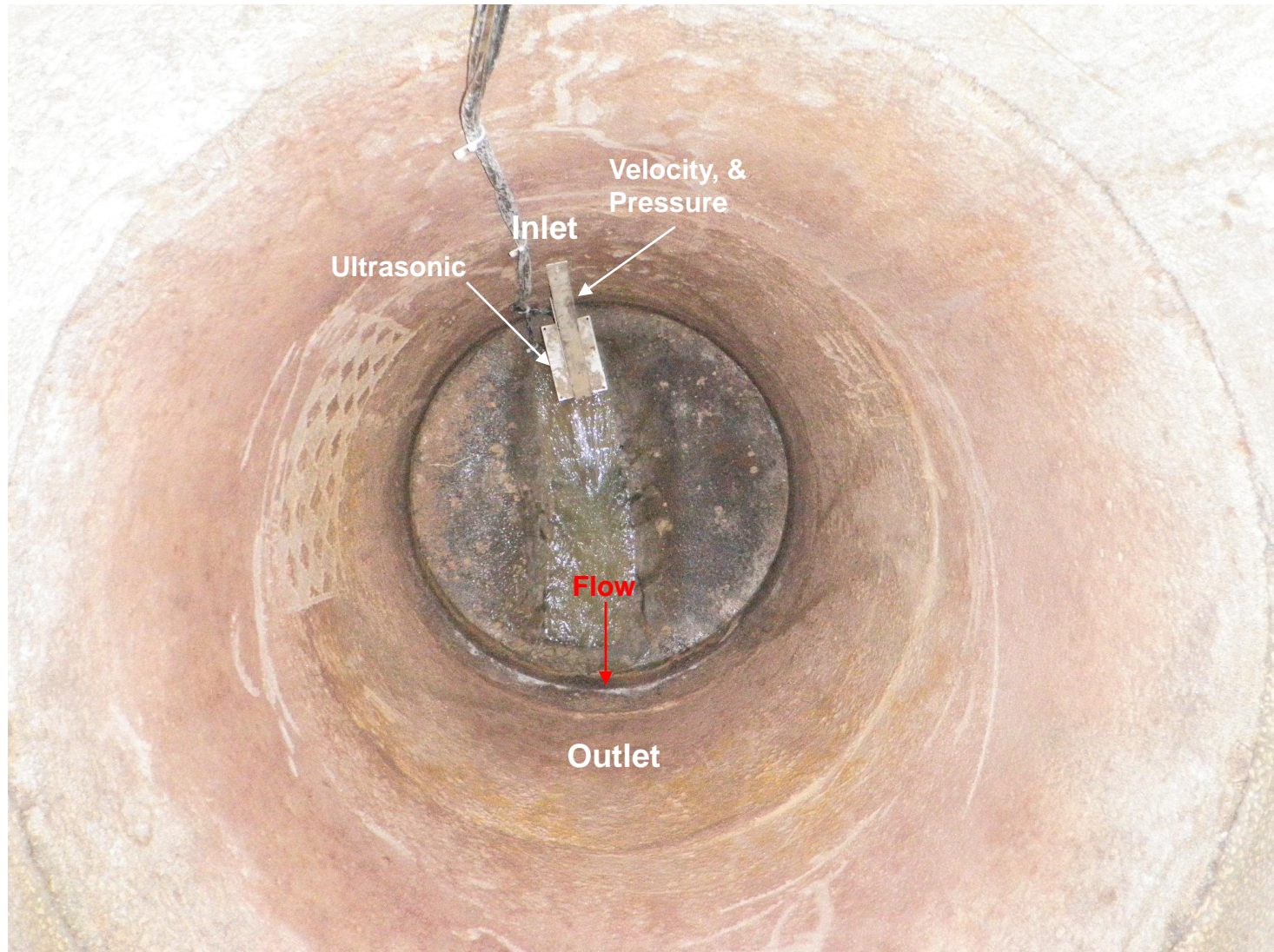
Site access looking north



Bend\_003151

Site set up

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SERVICES®**

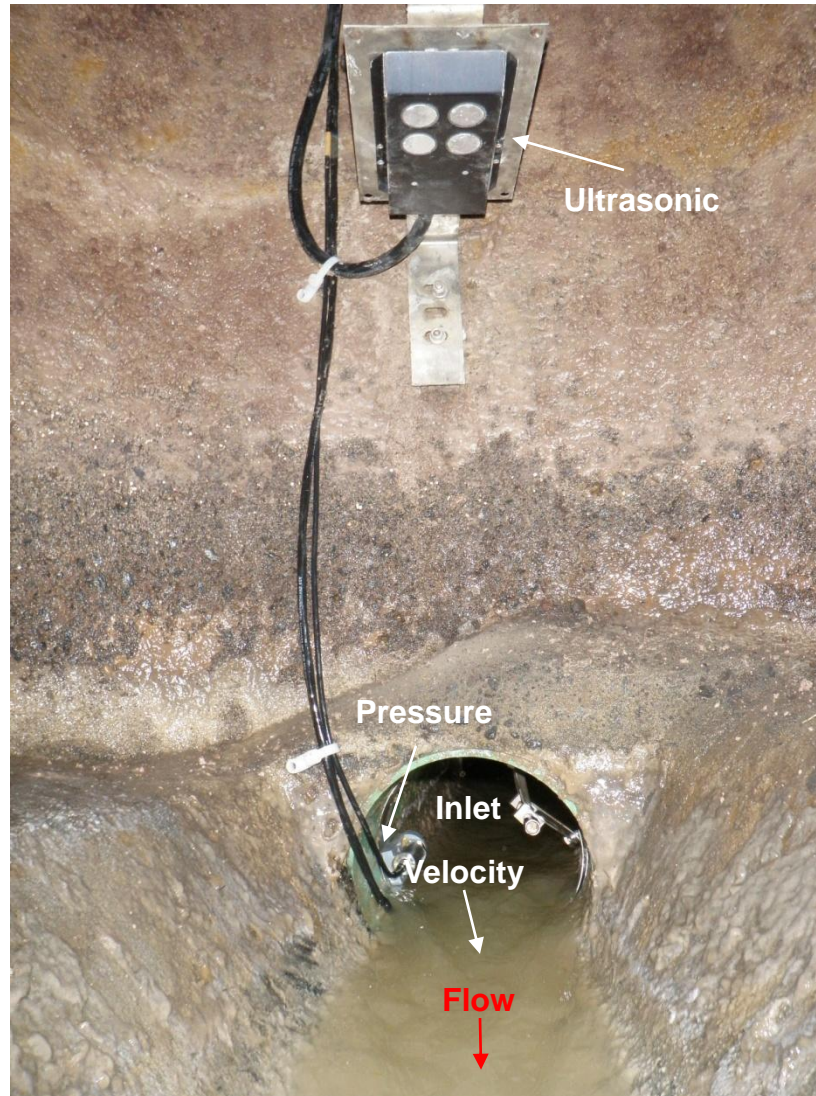


View of site looking north



Bend\_003151

Site set up



**View of inlet and sensors**



Bend\_003151

Site set up

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SERVICES®



View of outlet



# SCATTERGRAPH REPORT

Bend\_003151

## Flow Monitor

Bend\_003151

Pipe Height  
7.75 in

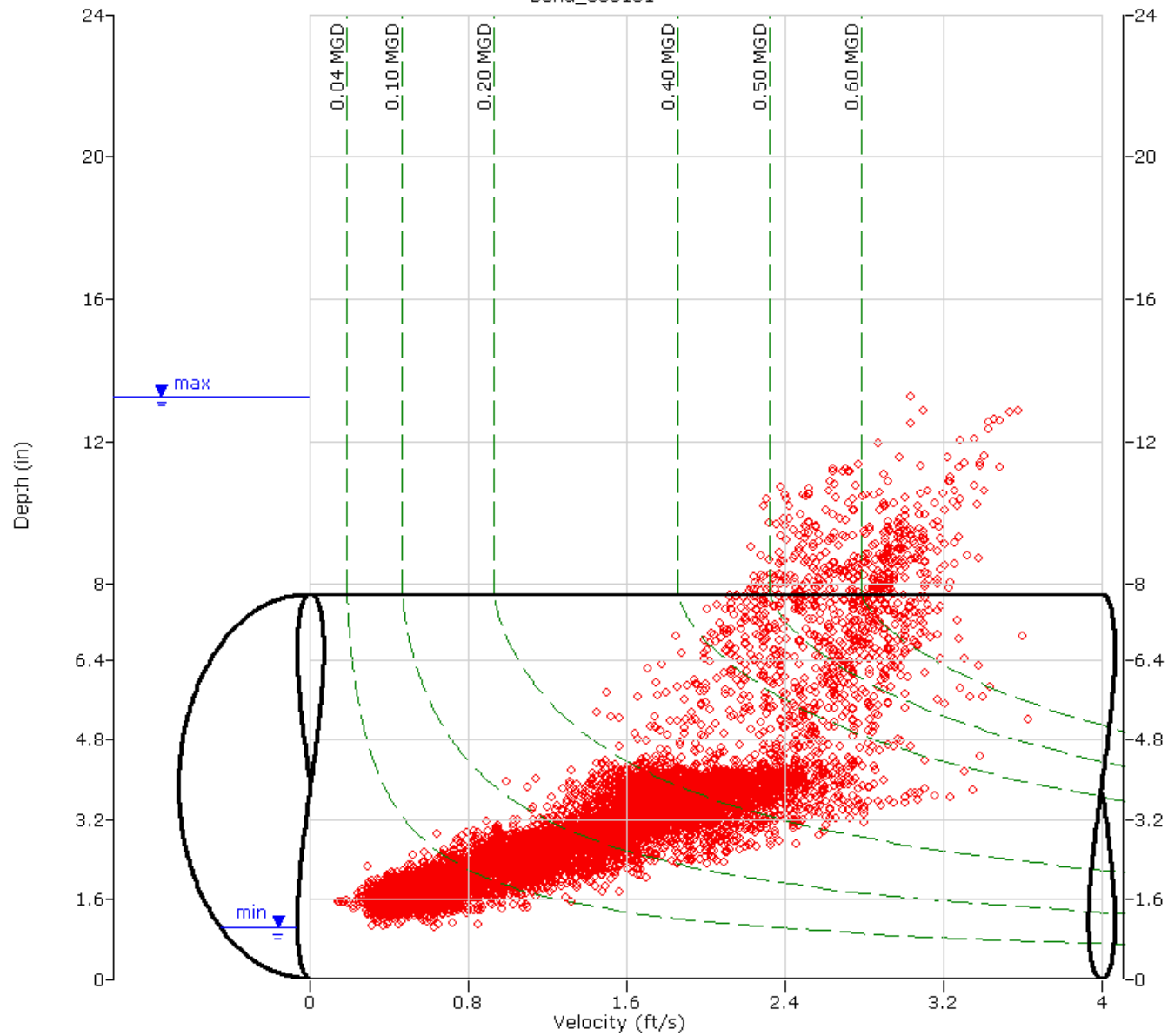
## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth

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SERVICES





# HYDROGRAPH REPORT

Bend\_003151

## Flow Monitor

Bend\_003151

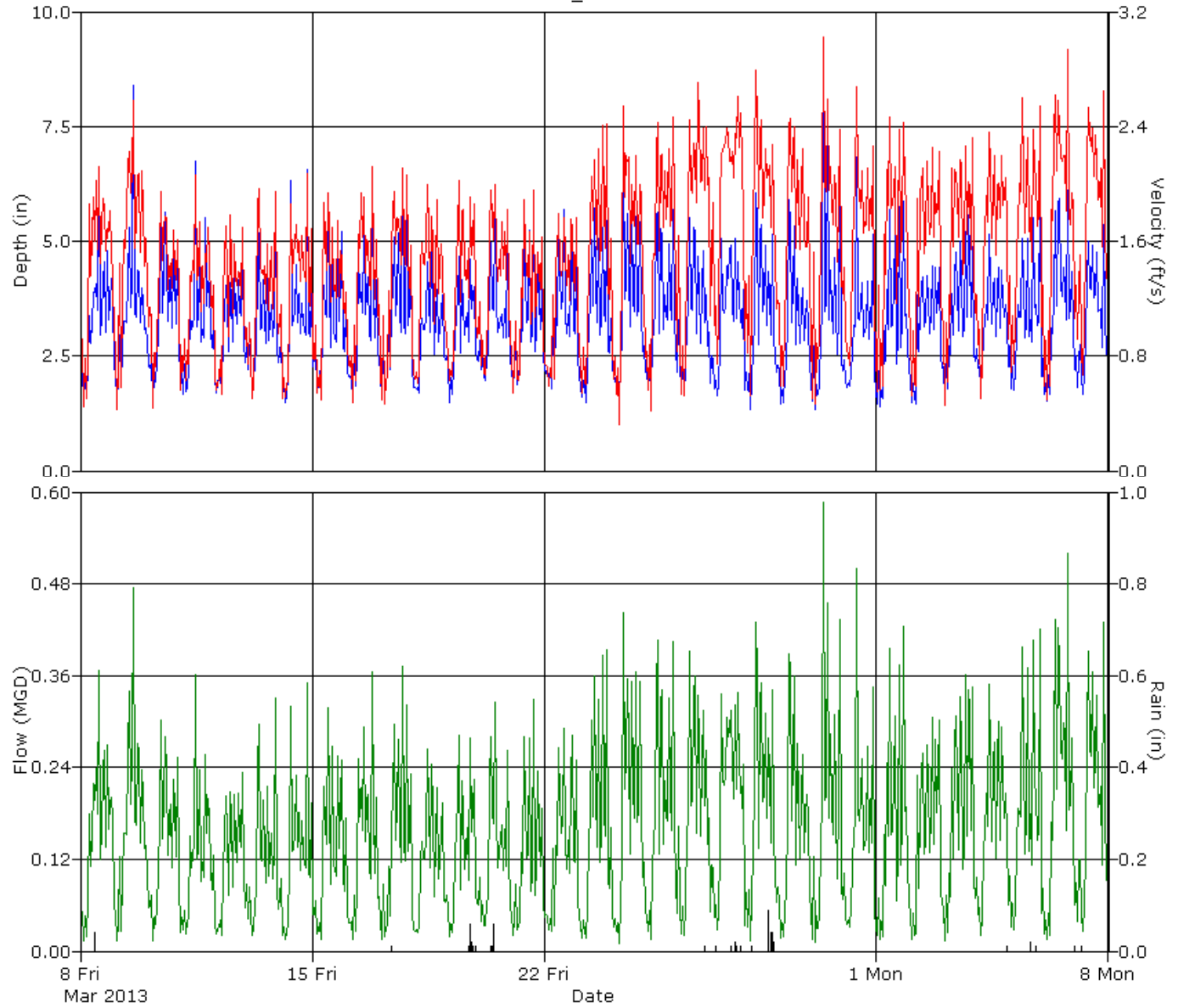
Pipe Height  
7.75 in.

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_003161	
Measured Pipe Height (in)	14.38
Nominal Pipe Height (in)	15
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_003161 was located in the North of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern with lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a fairly repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 8%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	4.43	1.85	0.402
Minimum	1.40	0.46	0.021
Maximum	8.86	3.16	1.219
Time of Minimum	4/2/2013 5:20 AM	3/19/2013 4:00 AM	4/6/2013 3:05 AM
Time of Maximum	3/27/2013 1:30 PM	3/9/2013 4:00 PM	3/30/2013 10:20 AM

### Data Quality

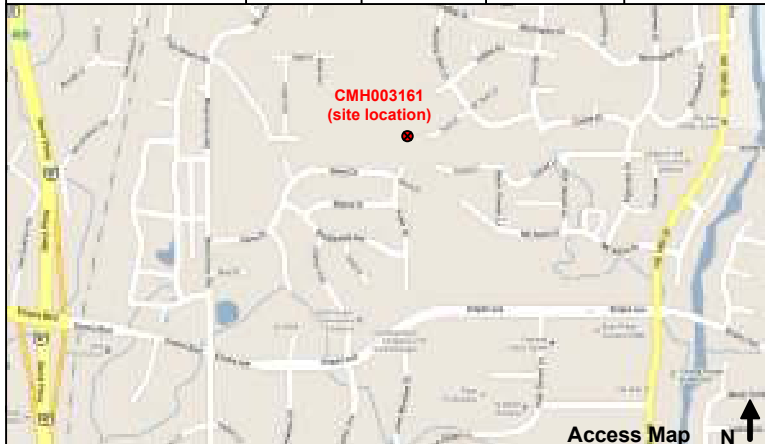
The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Invalid velocity data as a result of debris settling on the sensor were flagged from the data set (March 24 - 27, 2013).

Percent Uptime (%)	
Depth	100
Velocity	91
Quantity	91



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: SW	
Site Name: Bend_003161		Monitor Series: 5000 AG		Monitor S/N: 21703	
Address/Location: West on dirt road from intersection of Town Dr. and Wishing Well Ln.		Manhole #		CMH003161	
		Coordinates:		44° 5'41.63"N 121°17'22.47"W	
		Pipe Height:		14.38"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 14.50"
					IP Address: 166.219.172.70



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/23/2013 @ 13:39	Manhole Depth:	~ 11'
Site Hydraulics:	Waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	L/S	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	3.63" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	10.75" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	2.64 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.50"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Cross Section</p>	<p>Planar</p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_JRRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_003161 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☒ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Sean Winder

Signature: Signed copy can be obtained from ADS

Date: 2/23/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/23/13



Bend\_003161

Site location

**ADS ENVIRONMENTAL  
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Site access looking north



Bend\_003161

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



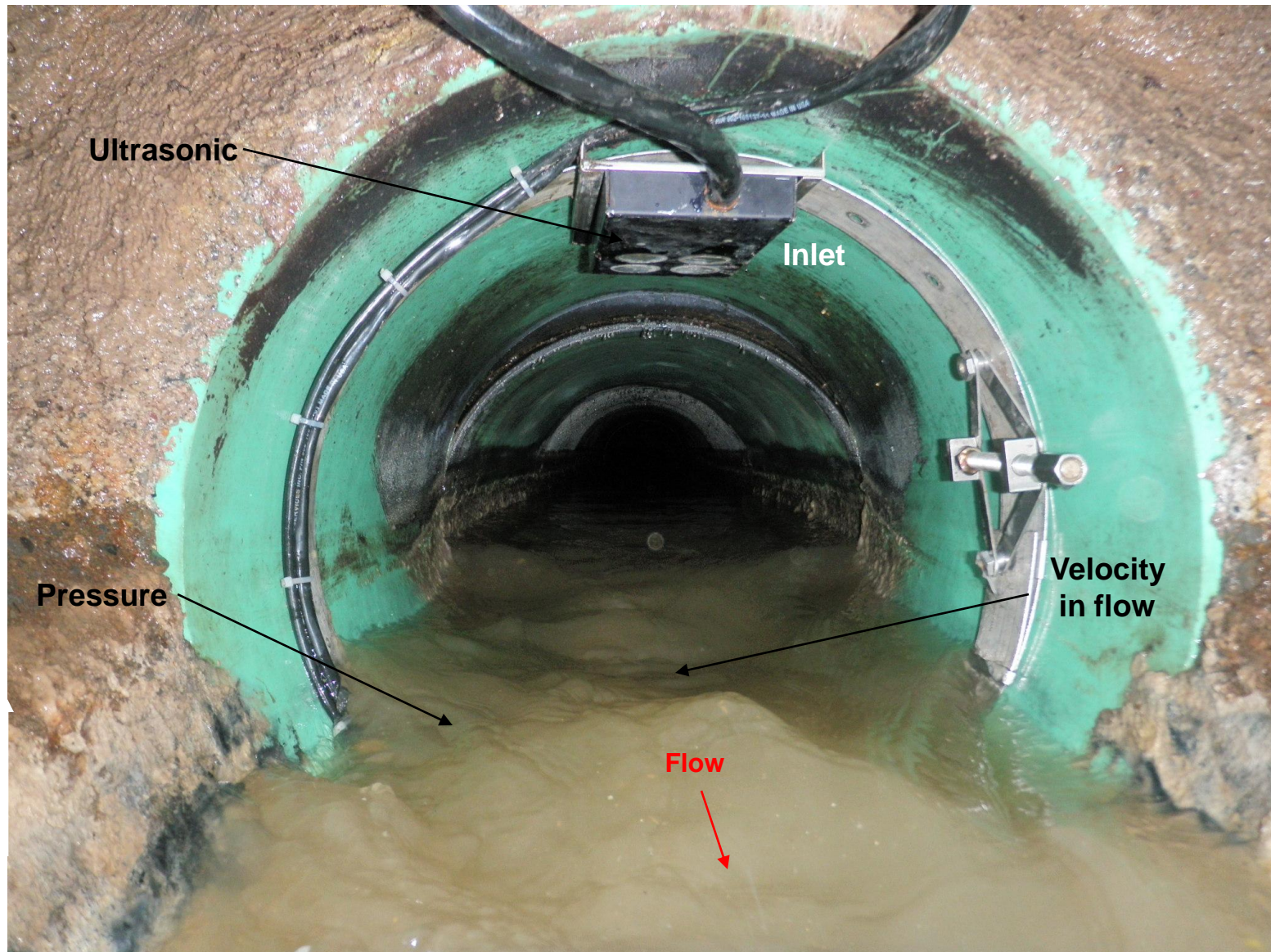
View down manhole facing north



Bend\_003161

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



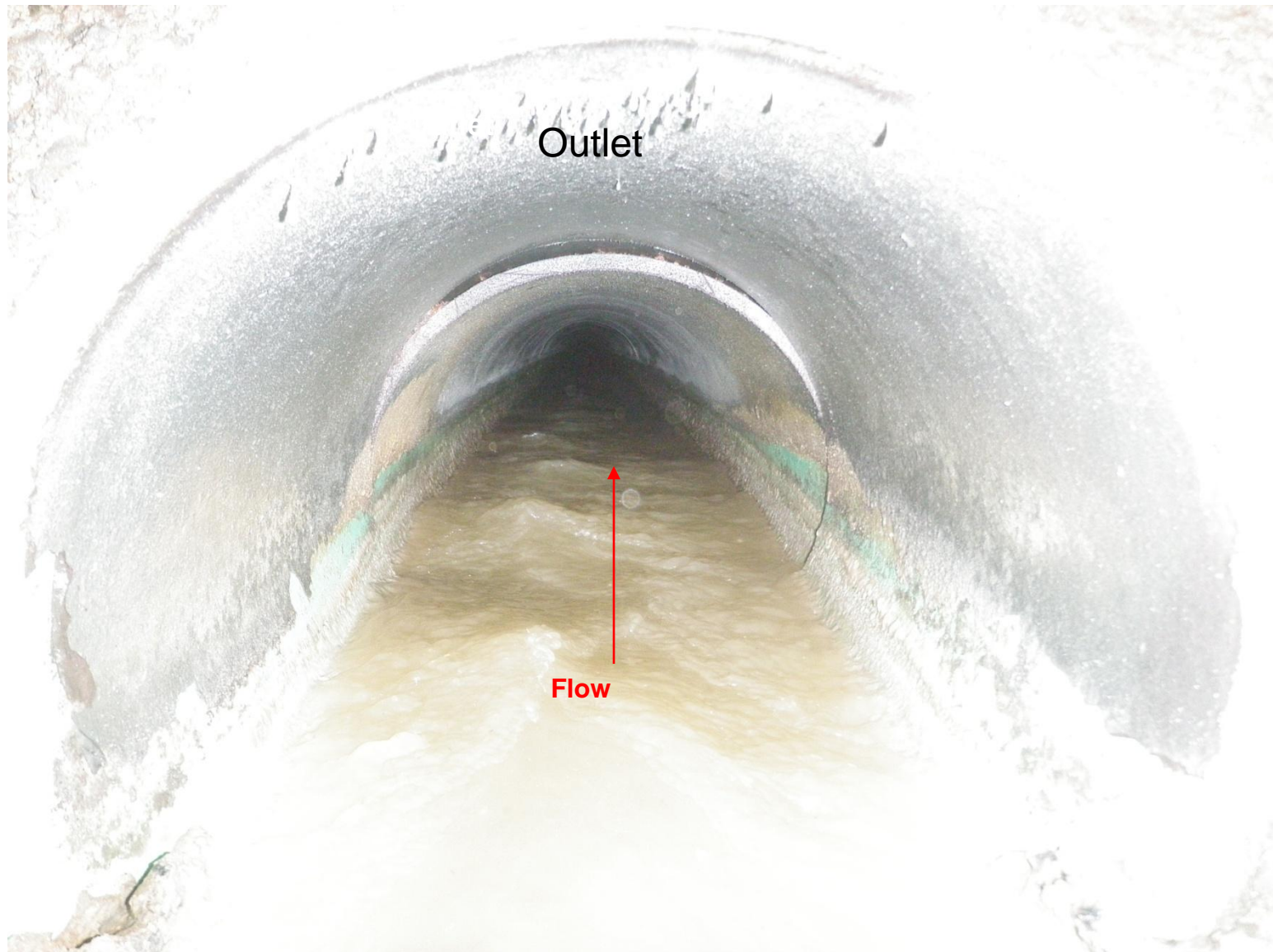
View of sensor placement and site hydraulics



Bend\_003161

Site outlet

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_003161

## Flow Monitor

Bend\_003161

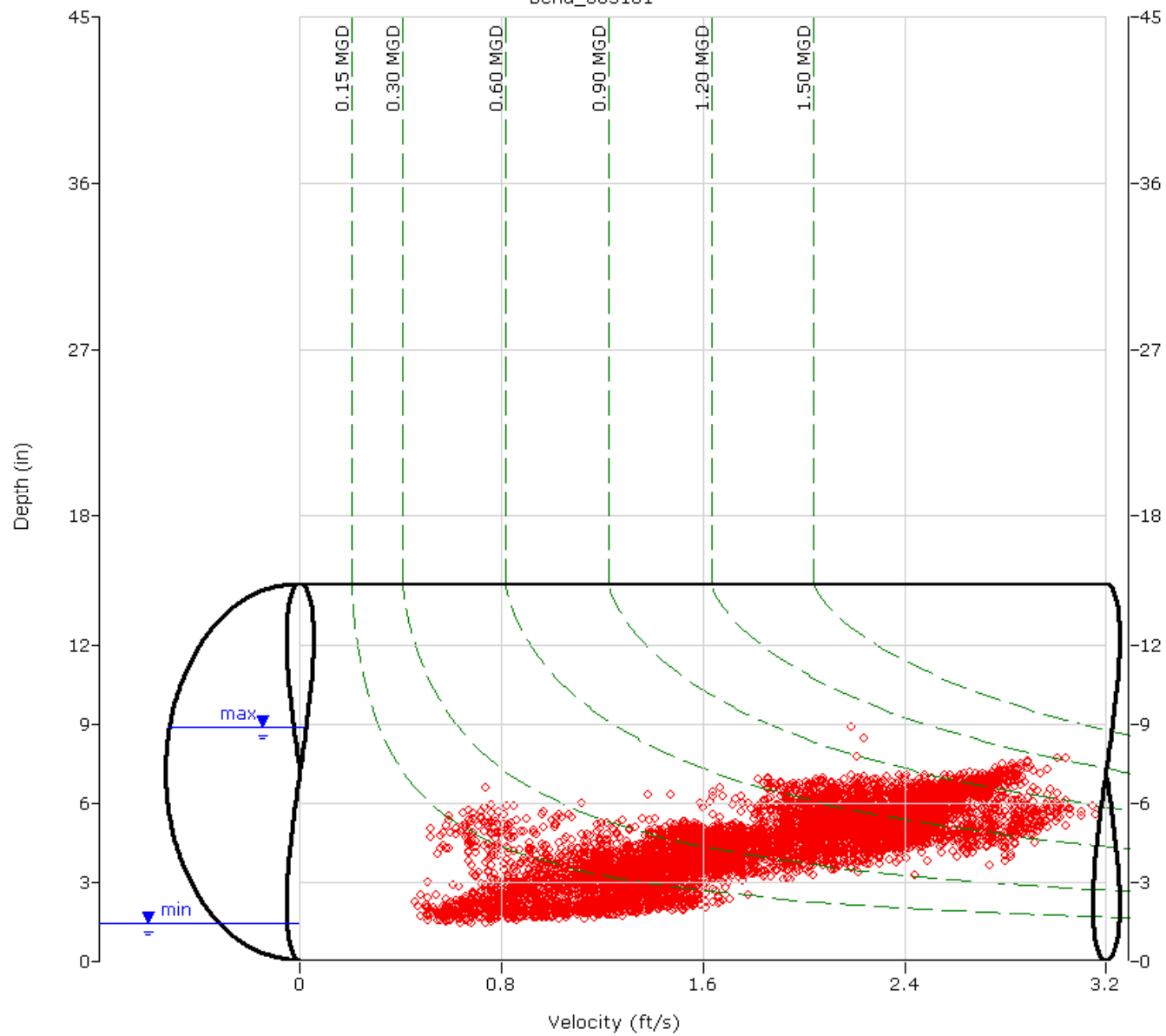
Pipe Height  
14.38 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_003161

## Flow Monitor

Bend\_003161

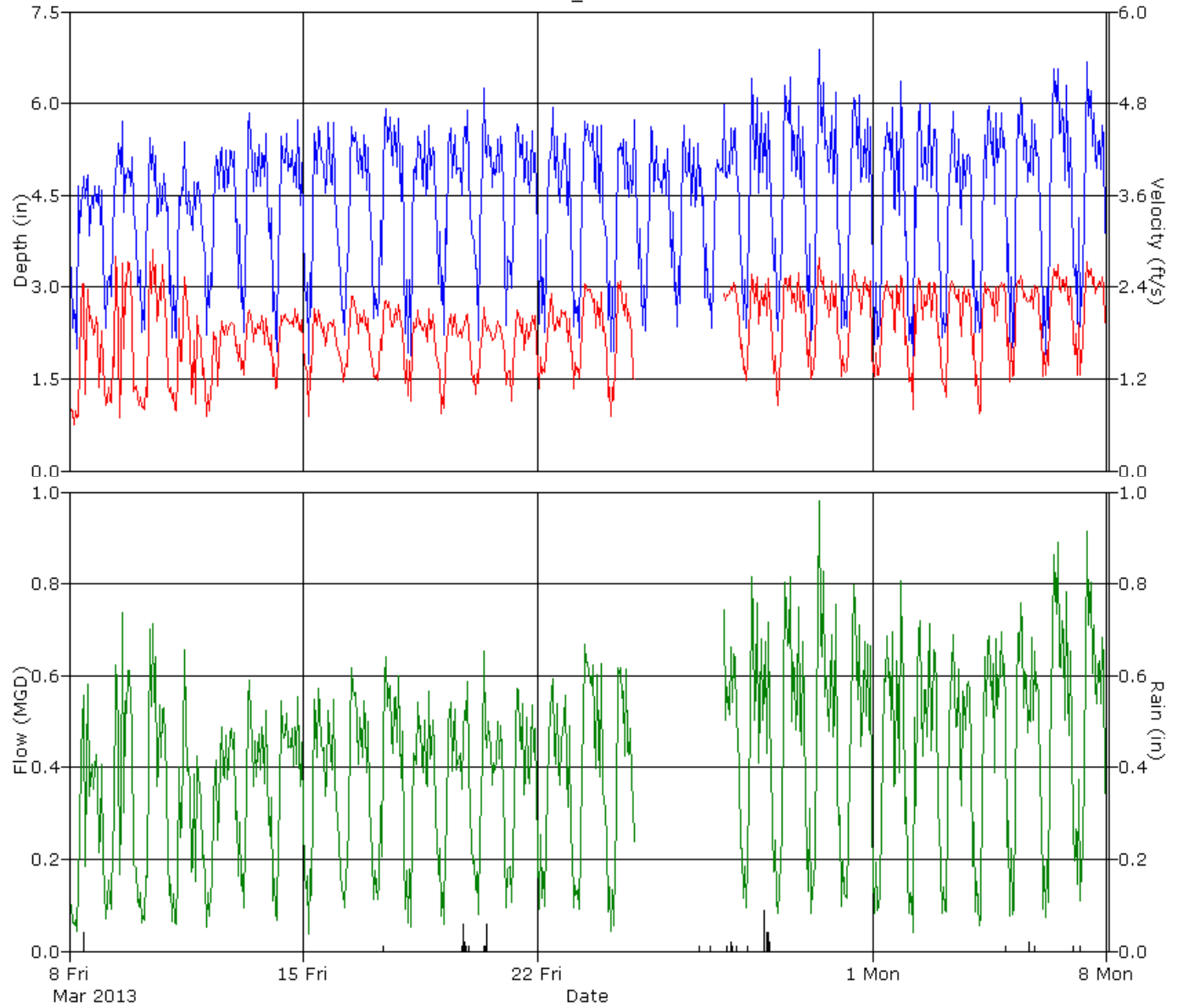
Pipe Height  
14.38 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_003221	
Measured Pipe Height (in)	20.25
Nominal Pipe Height (in)	20
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_003221 was located in the Northeast of Bend (see attached site report for details).

The hydrograph indicates a residential/commercial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set, with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.48	4.30	0.748
Minimum	1.36	0.90	0.042
Maximum	6.09	5.63	1.940
Time of Minimum	3/18/2013 4:25 AM	3/29/2013 4:30 AM	3/29/2013 4:30 AM
Time of Maximum	3/9/2013 10:10 AM	3/30/2013 11:15 AM	3/9/2013 10:10 AM

### Data Quality

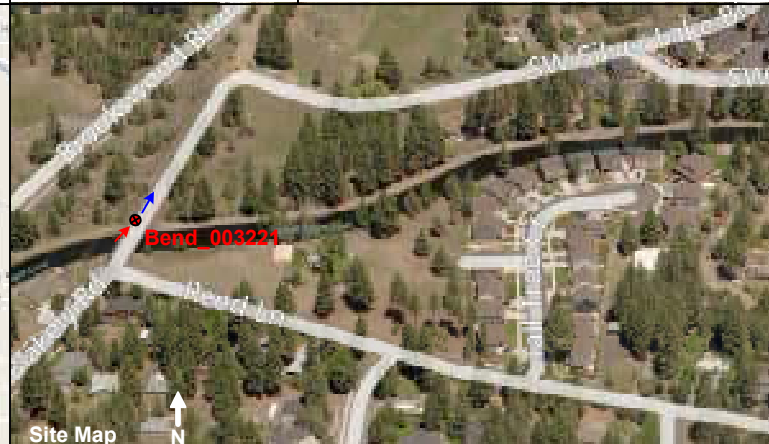
The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Invalid velocity data as a result of debris settling on the sensor were flagged from the data set (March 21 - 25, 2013).

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_003221		Monitor Series: 5000 AG		Monitor S/N: 20547	
Address/Location: North of Reed Ln. on SW Silver Lake Blvd.		Manhole #		CMH003221	
		Coordinates:		44° 2'2.98"N; 121°19'6.28"W	
		Pipe Height:		17.63"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 18.38"
					IP Address: 166.219.51.125



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/26/13 @ 8:36	Manhole Depth:	~ 11
Site Hydraulics:	Fast, Ripples	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	L/S	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	Waves	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	3.75 +/- .25"	Access Pole #:	Doesn't apply
Range (Air DOF):	13.88" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	5.80 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:



### Flow Monitoring Site Safety Plan

**Project Name:** Bend .TFM.OR.12 **Site ID:** Bend\_003221 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site has no usable rungs. Manhole access by tripod only.

**\* Site Classification**

Class	Description
<input type="checkbox"/> 1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/> 2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/> 3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/> 4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/> 5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/26/13

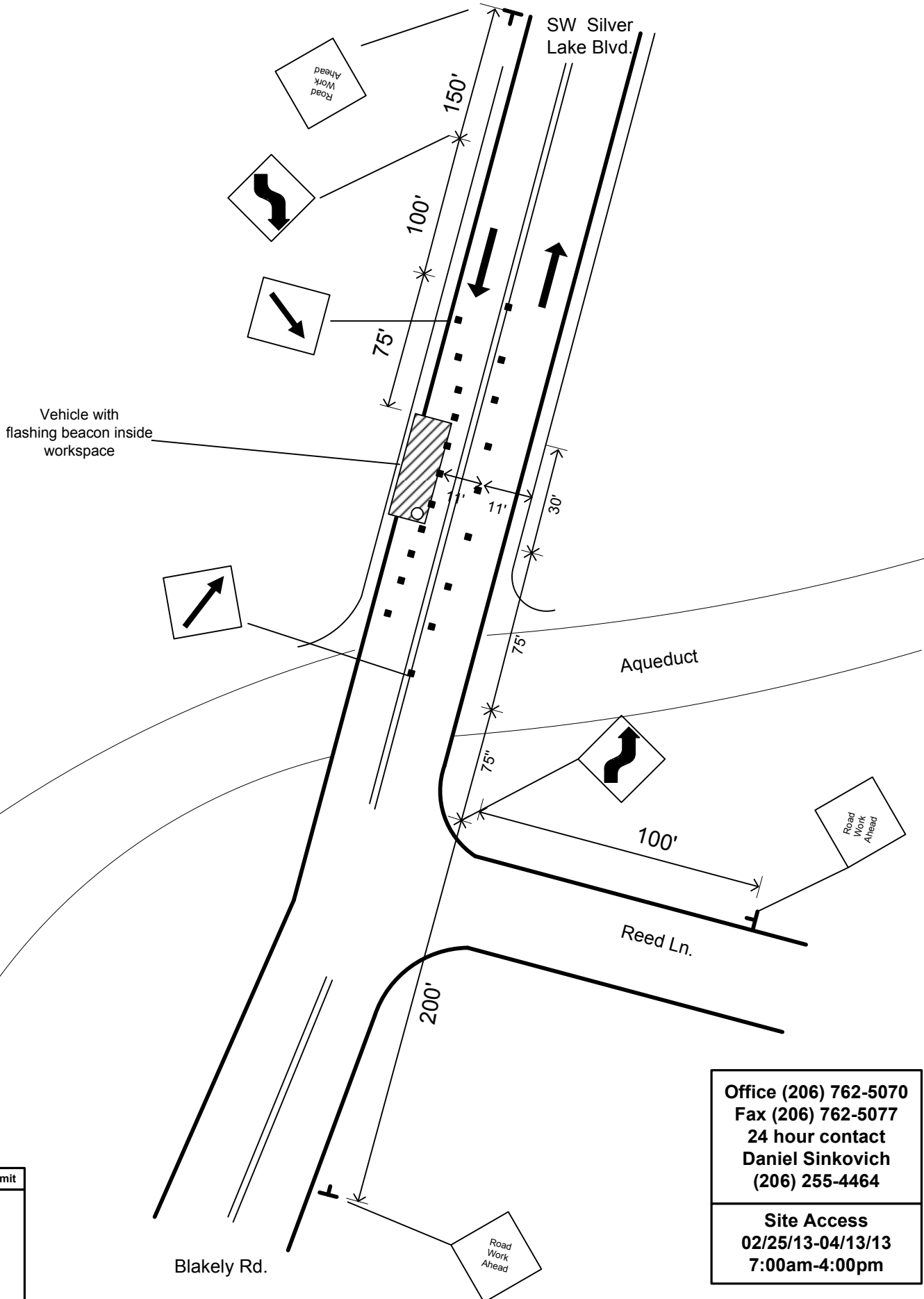
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/26/13





Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

Site Access  
02/25/13-04/13/13  
7:00am-4:00pm



Bend\_003221

Site location

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Site access

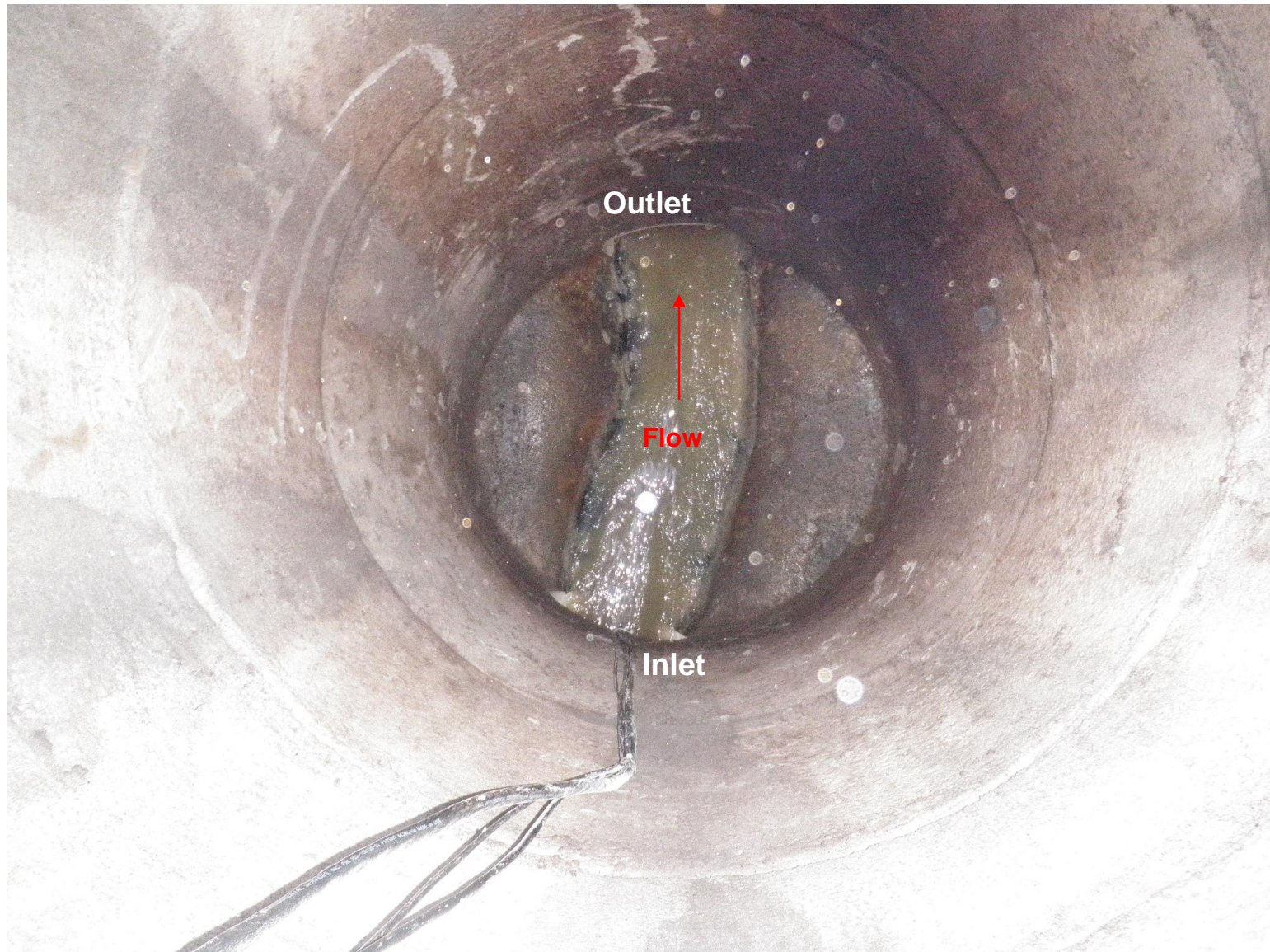
Site access looking north



Bend\_003221

Site set up

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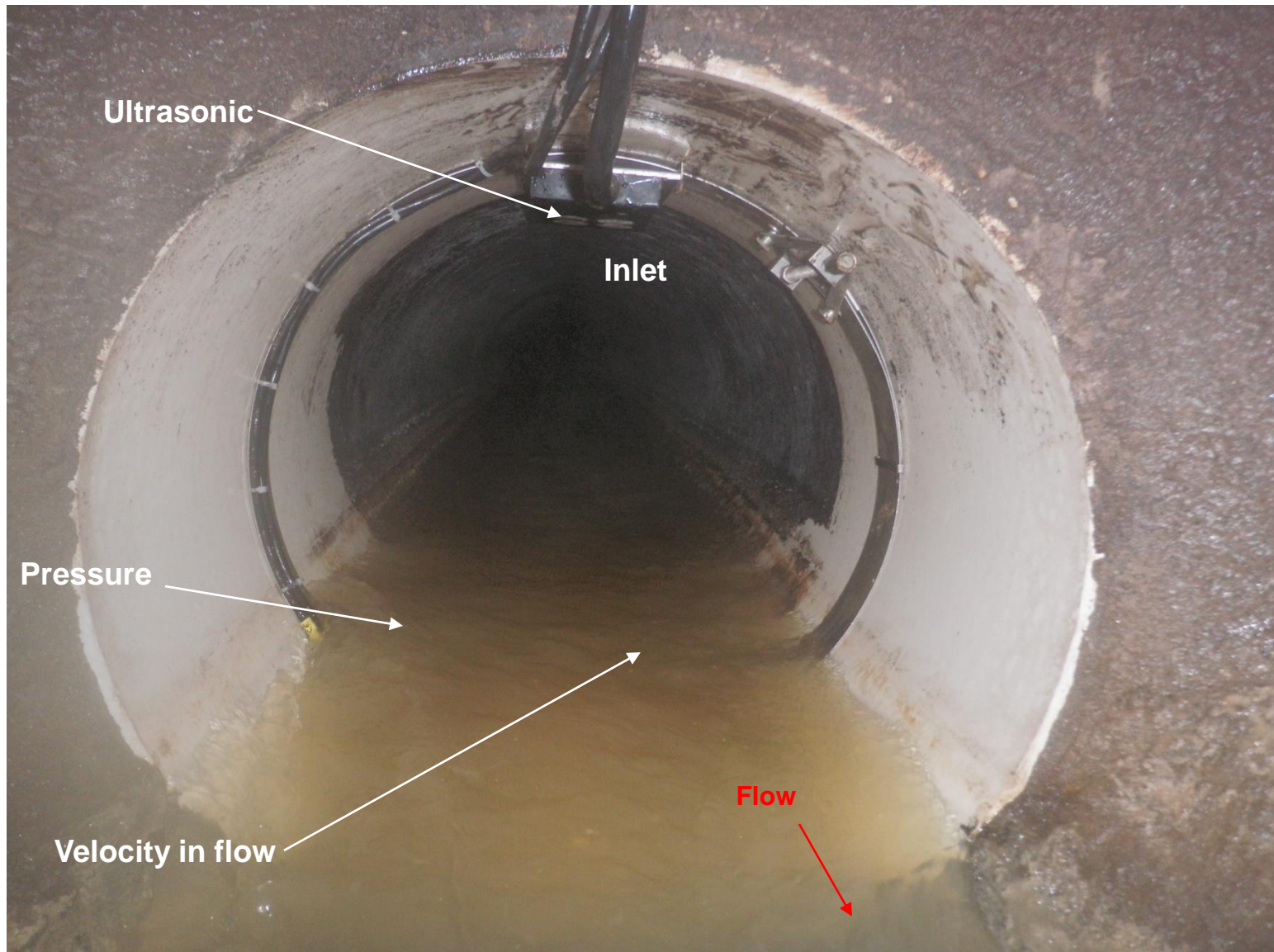
View down manhole facing north



Bend\_003221

Site set up

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SERVICES®**



**View of sensor placement and site hydraulics**



Bend\_003221

Site outlet

**ADS** ENVIRONMENTAL  
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View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_003221

## Flow Monitor

Bend\_003221

Pipe Height  
17.63 in

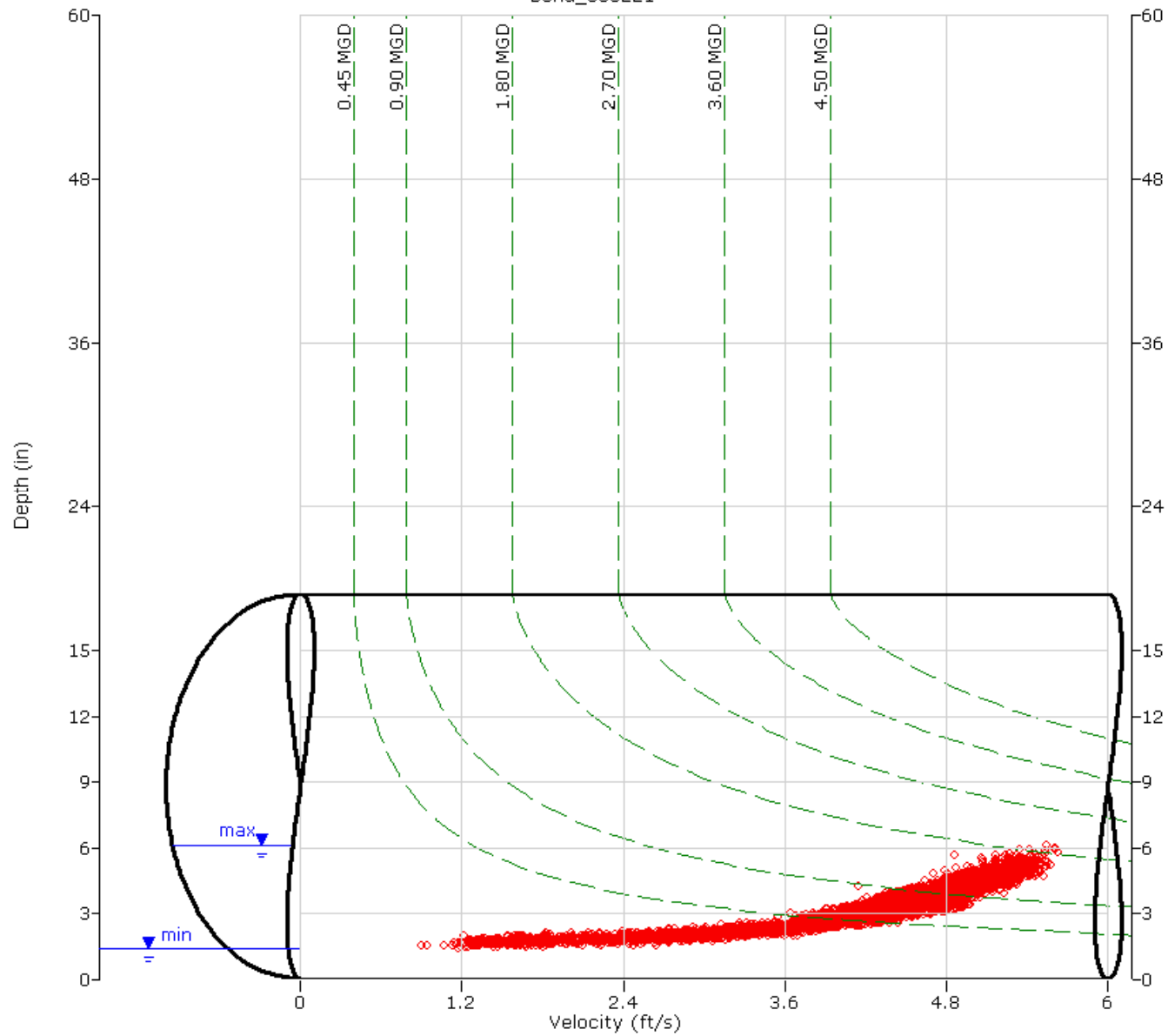
## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth

AGS ENVIRONMENTAL  
SERVICES





# HYDROGRAPH REPORT

Bend\_003221

## Flow Monitor

Bend\_003221

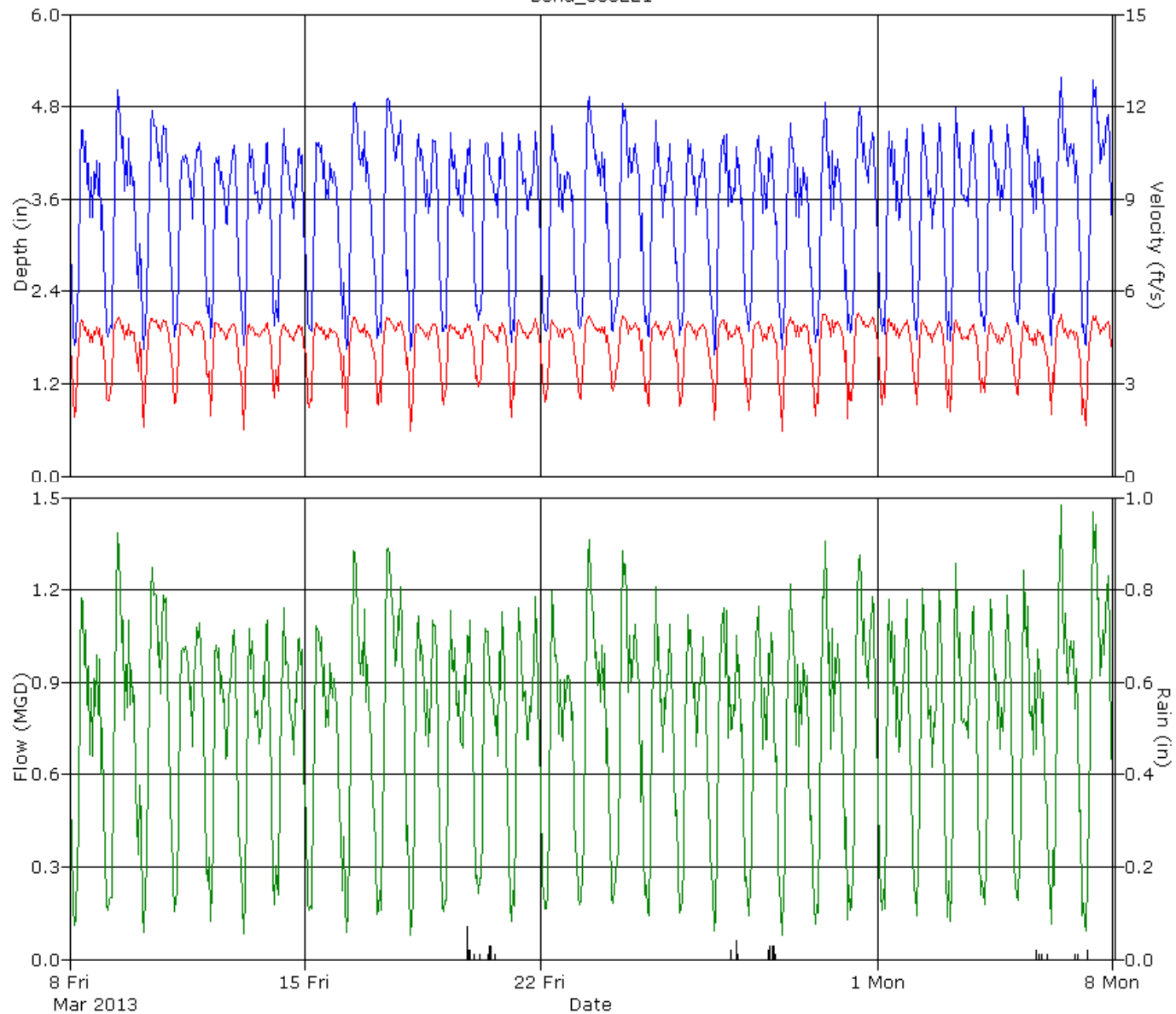
Pipe Height  
17.63 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

---

### Site Information

Bend_004010	
Measured Pipe Height (in)	20.25
Nominal Pipe Height (in)	20
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_004010 was located in the Northeast of Bend (see attached site report for details).

The hydrograph indicates a residential/commercial diurnal flow pattern with a lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set, with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	9.06	0.99	0.703
Minimum	5.39	0.26	0.084
Maximum	14.18	1.60	1.745
Time of Minimum	4/6/2013 5:35 AM	4/6/2013 5:35 AM	4/6/2013 5:35 AM
Time of Maximum	4/6/2013 1:50 PM	3/14/2013 9:15 AM	4/6/2013 1:50 PM

### Data Quality

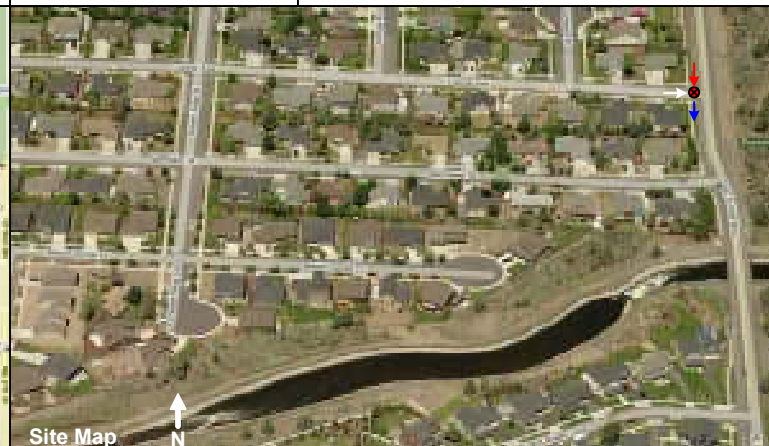
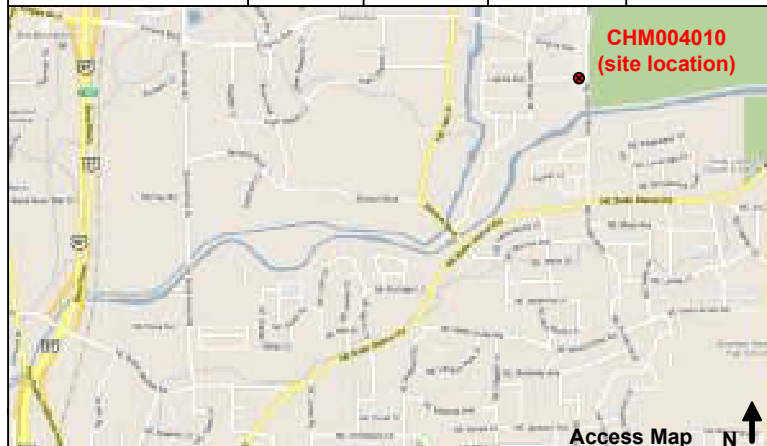
The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Invalid velocity data as a result of debris settling on the sensor were flagged from the data set (March 21 - 25, 2013).

Percent Uptime (%)	
Depth	100
Velocity	87
Quantity	87



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_004010		Monitor Series: 5000 AG		Monitor S/N: 21781	
Address/Location: 20998 Lupine Ave.		Manhole #		CMH004010	
		Coordinates:		44° 5'18.87"N; 121°16'26.08"W	
		Pipe Height:		20.25"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 21.50"
					IP Address: 166.219.49.145



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	3/6/13 @ 11:30	Manhole Depth:	~ 12'
Site Hydraulics:	Moderate flow, smooth	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	PVC/ Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	Heavy influence by side line, silt	Telephone Information:	Doesn't apply
Depth of Flow:	9.75 +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	10.50" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.30 fps	Road Cut Length:	Doesn't apply Feet
Silt:	1.25"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Cross Section</p>	<p>Planar</p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: JRRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
---

5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_004010 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input checked="" type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only.  
Site is located adjacent to an intersection, follow all Traffic control plan procedures.

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 3/6/13

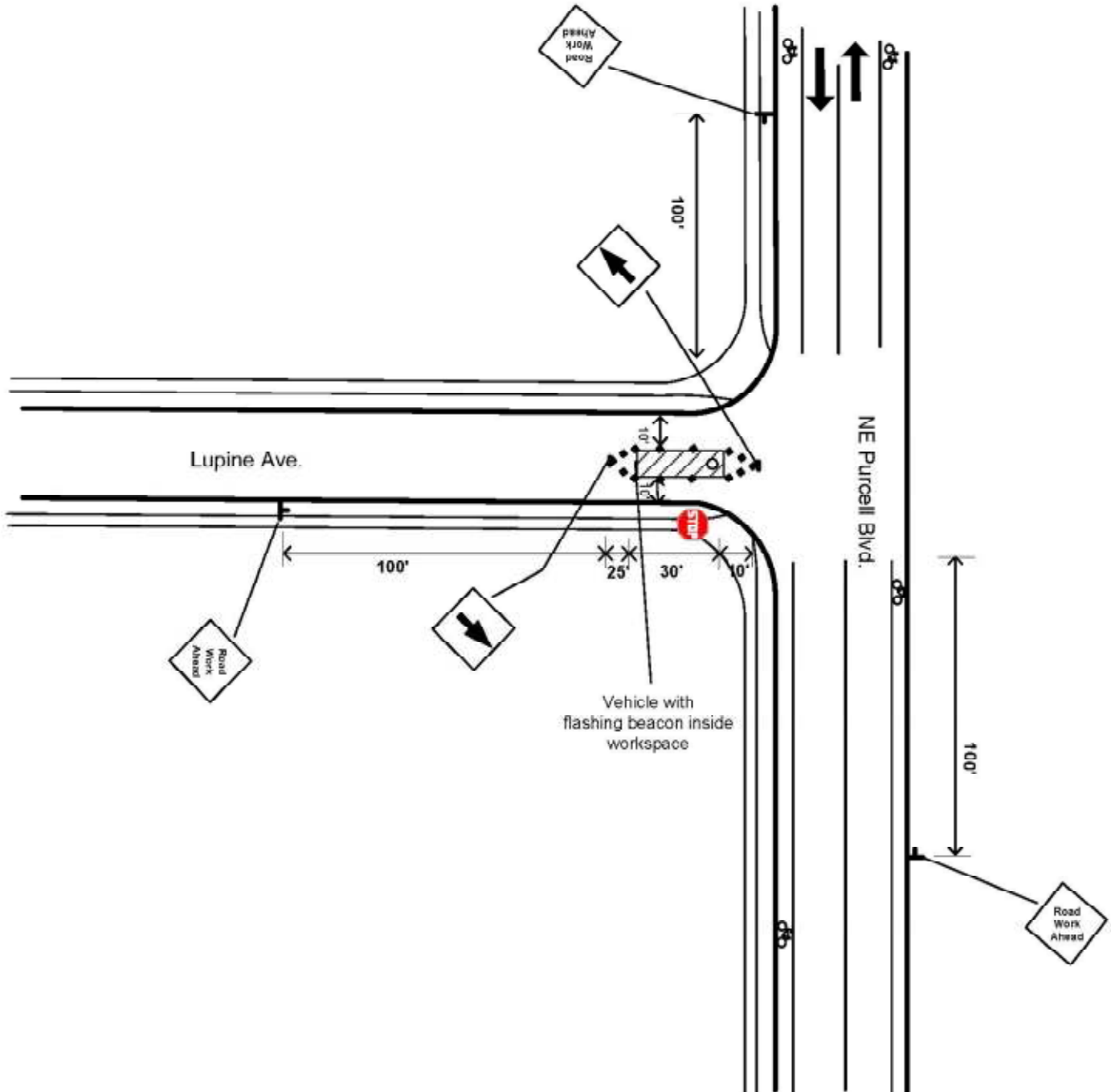
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 3/6/13





Posted Speed Limit	
NE Purcell Blvd.	Lupine Ave.
SPEED LIMIT 35	SPEED LIMIT 25

Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

Site Access  
03/06/13-04/13/13  
7:00am-4:00pm



Bend\_004010

Site Access

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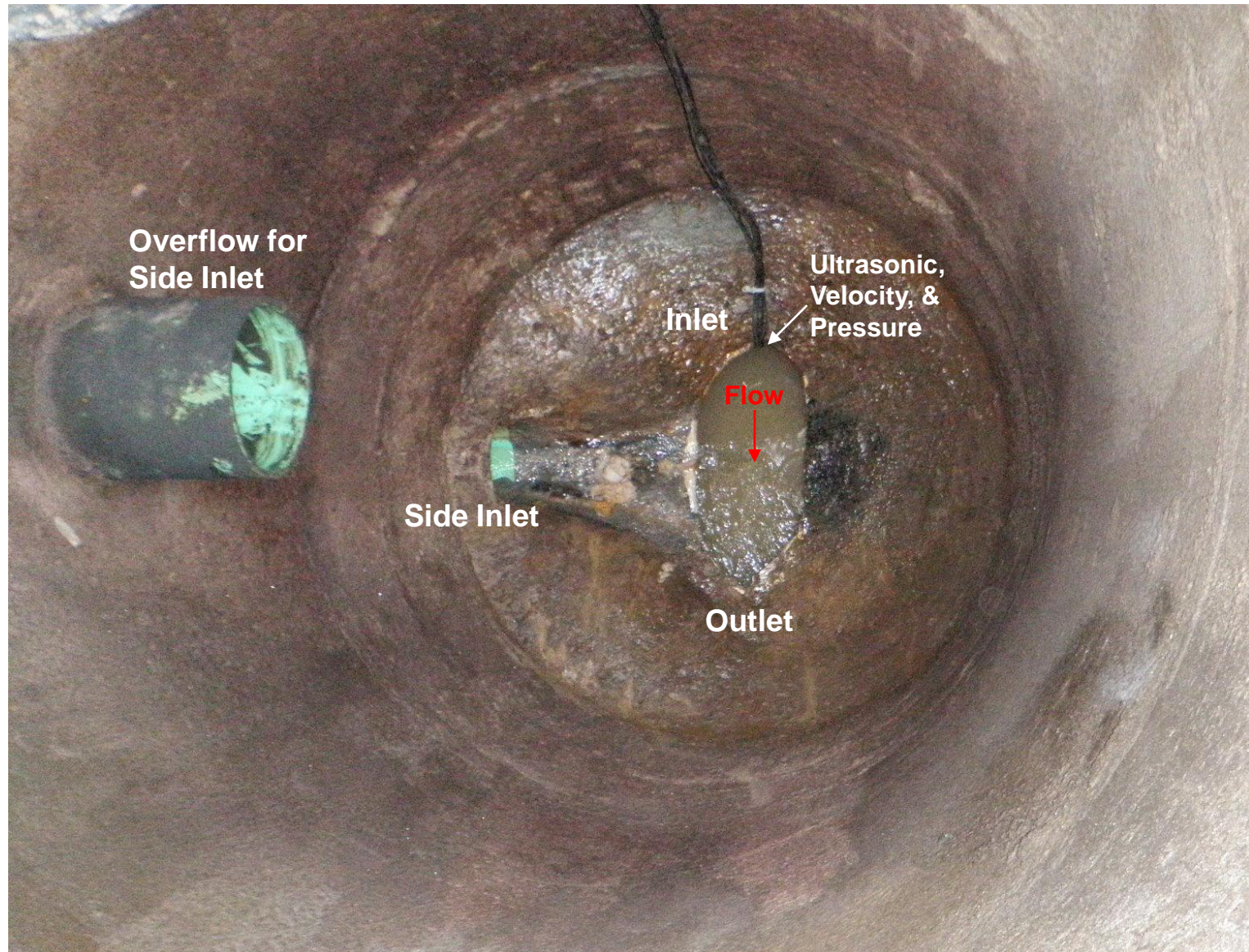


Site access looking east



Bend\_004010

Site set up



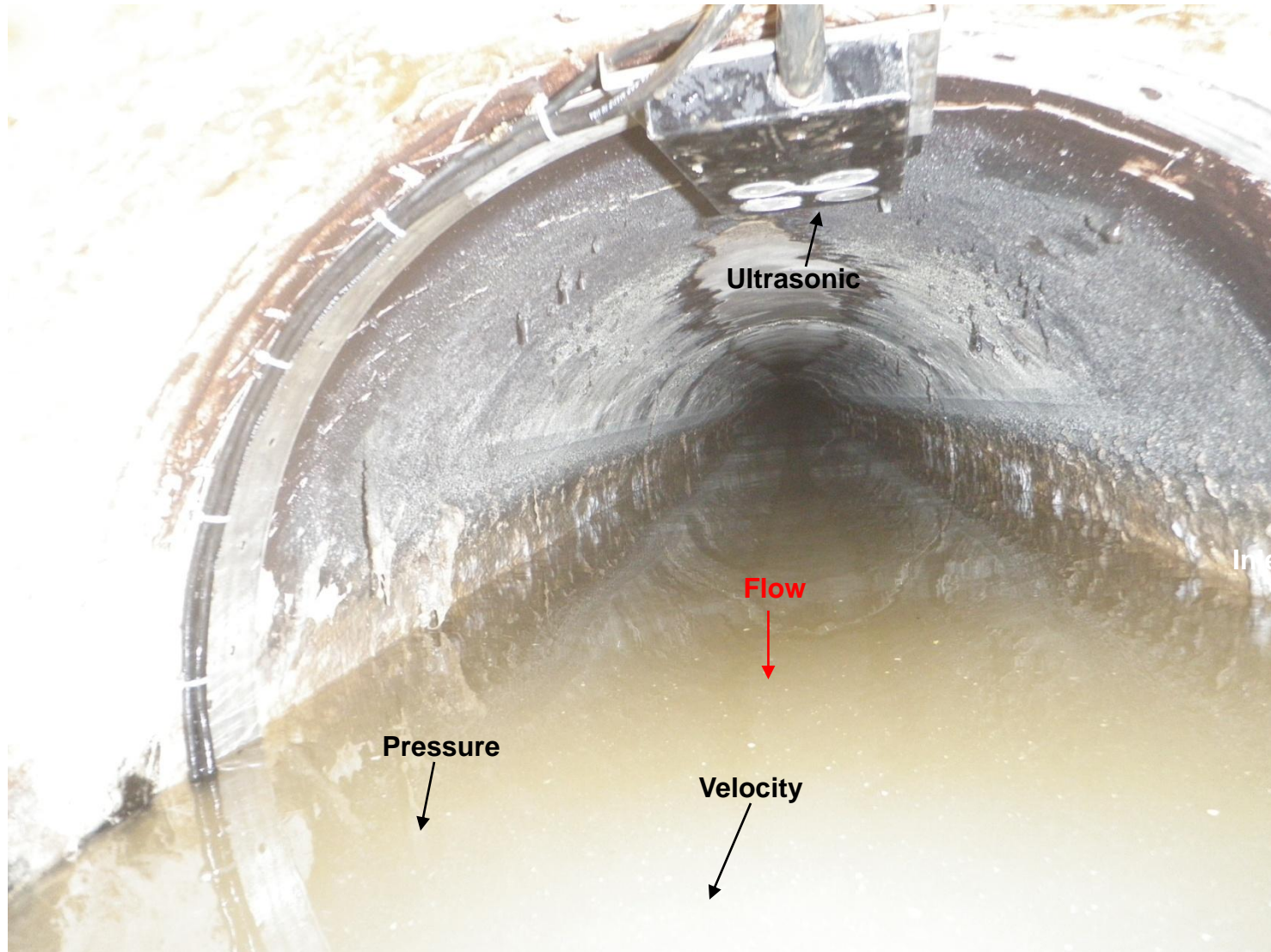
View of site looking north



Bend\_004010

Site set up

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SERVICES®**



View of inlet and sensors



Bend\_004010

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of outlet



# SCATTERGRAPH REPORT

Bend\_004010

## Flow Monitor

Bend\_004010

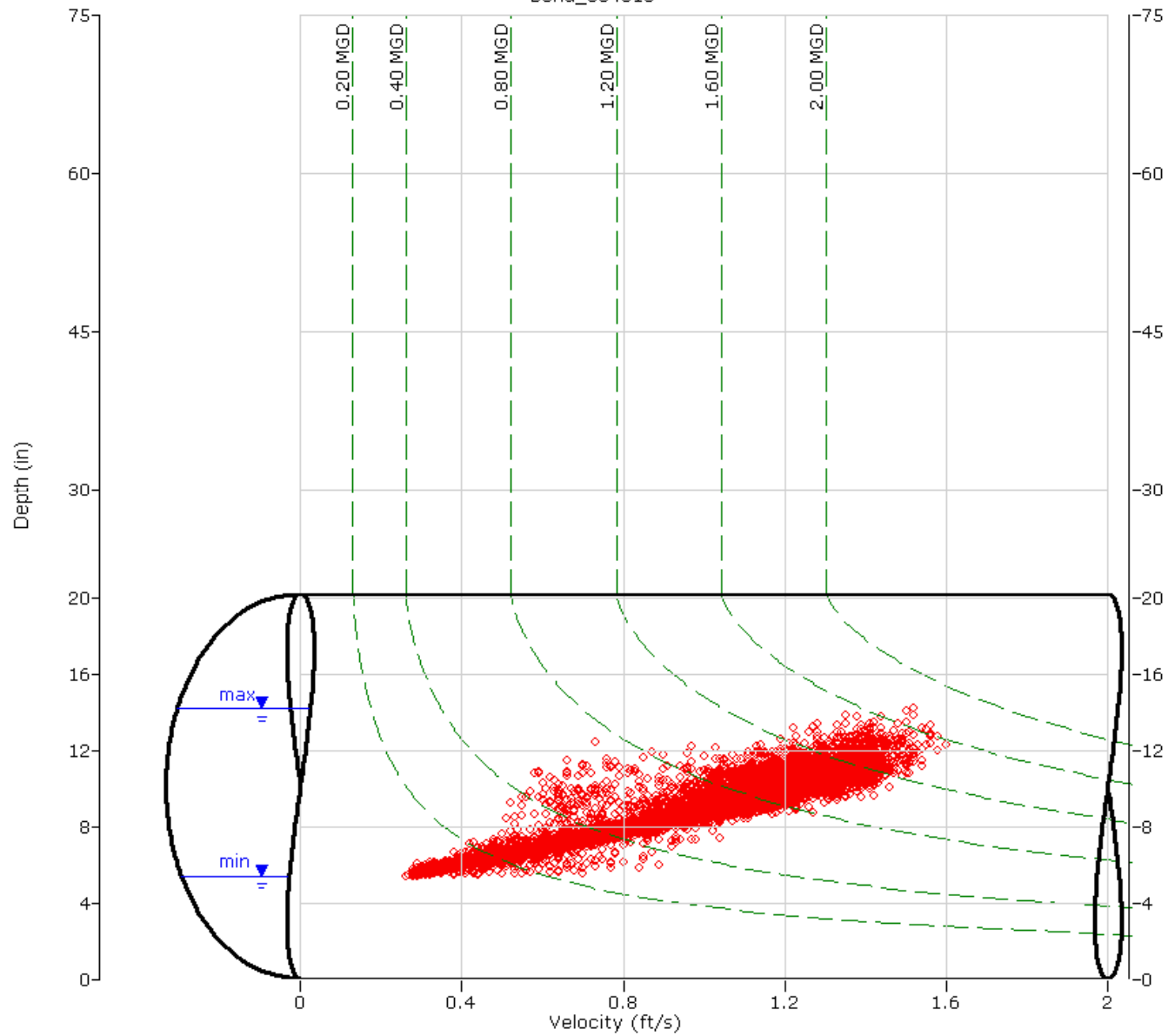
Pipe Height  
20.25 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - Iso-Q™
- - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_004010

## Flow Monitor

Bend\_004010

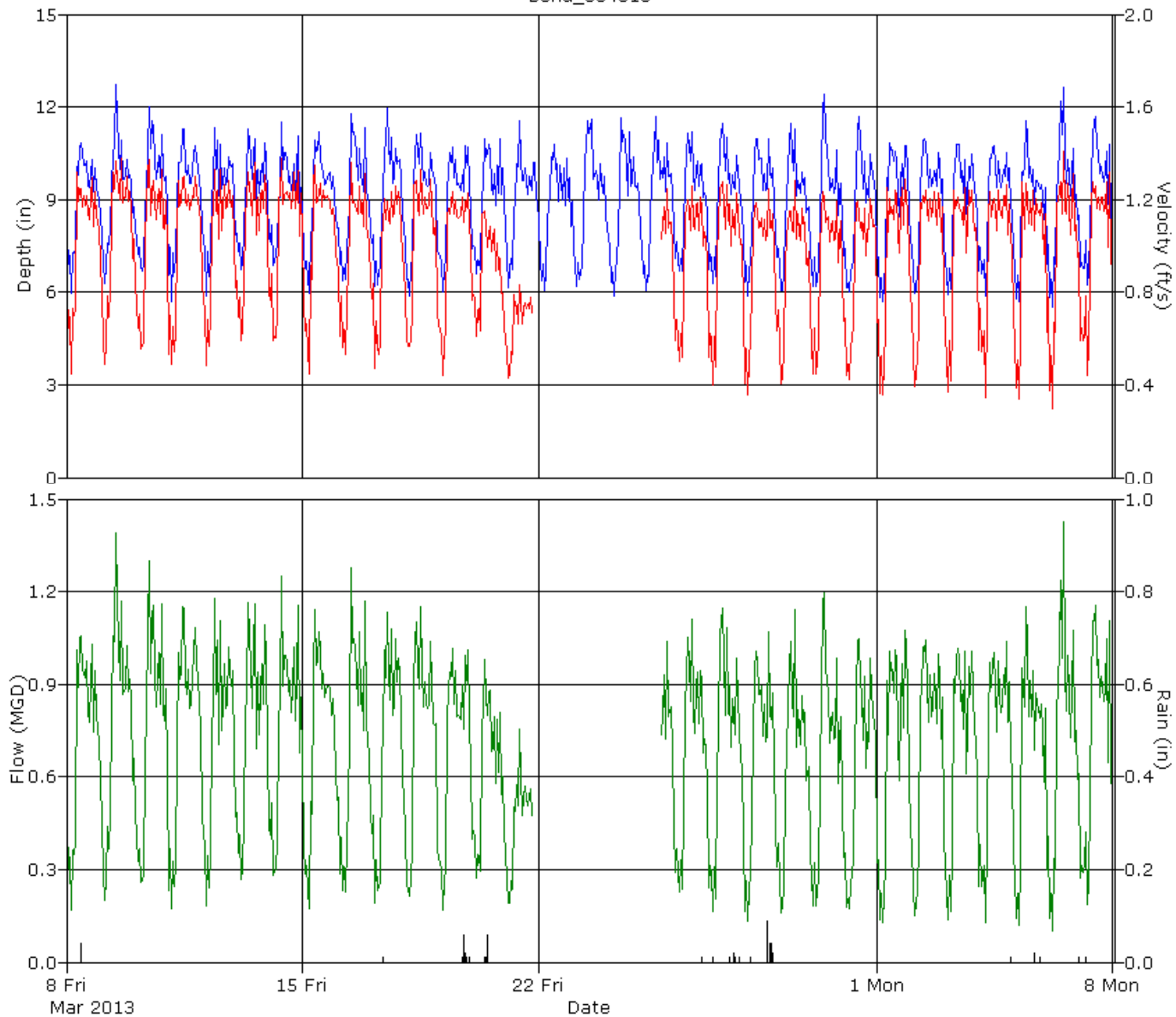
Pipe Height  
20.25 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

---

### Site Information

Bend_006520	
Measured Pipe Height (in)	35.75
Nominal Pipe Height (in)	36
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_006520 was located in the Northwest of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern with lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.80	1.38	0.255
Minimum	1.69	0.34	0.027
Maximum	4.21	2.18	0.616
Time of Minimum	3/8/2013 4:50 AM	3/8/2013 4:50 AM	3/8/2013 4:50 AM
Time of Maximum	3/10/2013 10:00 AM	4/3/2013 8:15 AM	3/31/2013 10:05 AM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_006520		Monitor Series: 5000 AG		Monitor S/N: 21509	
Address/Location: 62950 O B Riley Rd.		Manhole #		CMH006520	
		Coordinates:		44° 5'7.49"N 121°18'29.73"W	
		Pipe Height:		35.75"	
Access: Drive		Type of System:		Sanitary <input checked="" type="checkbox"/> Storm <input type="checkbox"/> Combined <input type="checkbox"/>	
		Pipe Width:		37.13"	
		IP Address:		166.219.172.54	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/25/2013 @ 11:40	Manhole Depth:	~ 10'
Site Hydraulics:	Small standing wave	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No influences	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	2.75" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	33.00" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.99 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultra, Velocity, Pressure	Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height:	N/A	WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	Bend_JRRG	Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
---

5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_006520 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

No site specific hazards found at this site.

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/25/13

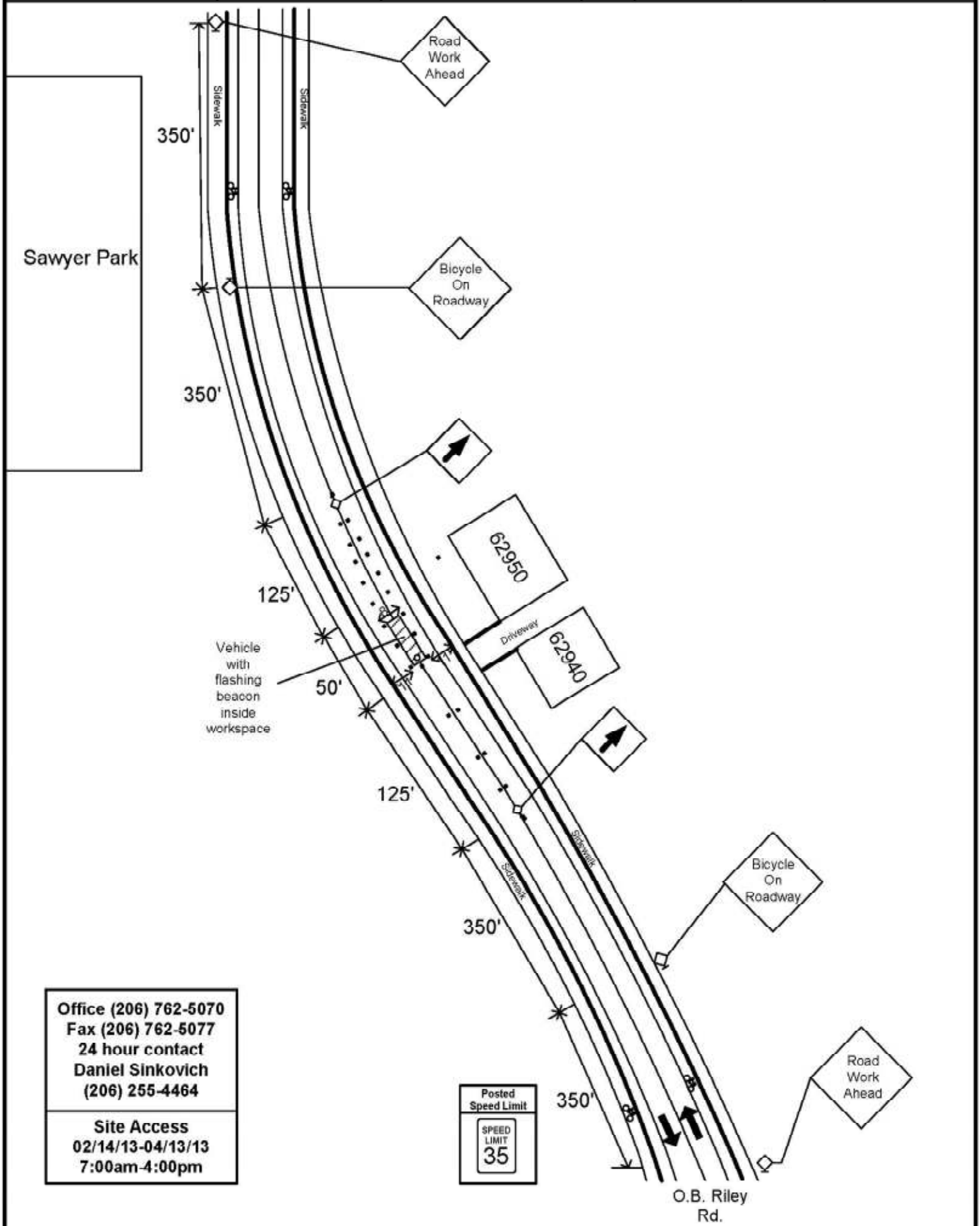
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

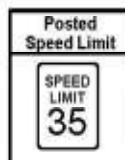
Date: 2/25/13





Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

Site Access  
02/14/13-04/13/13  
7:00am-4:00pm





Bend\_006520

Site Access

**ADS ENVIRONMENTAL  
SERVICES®**



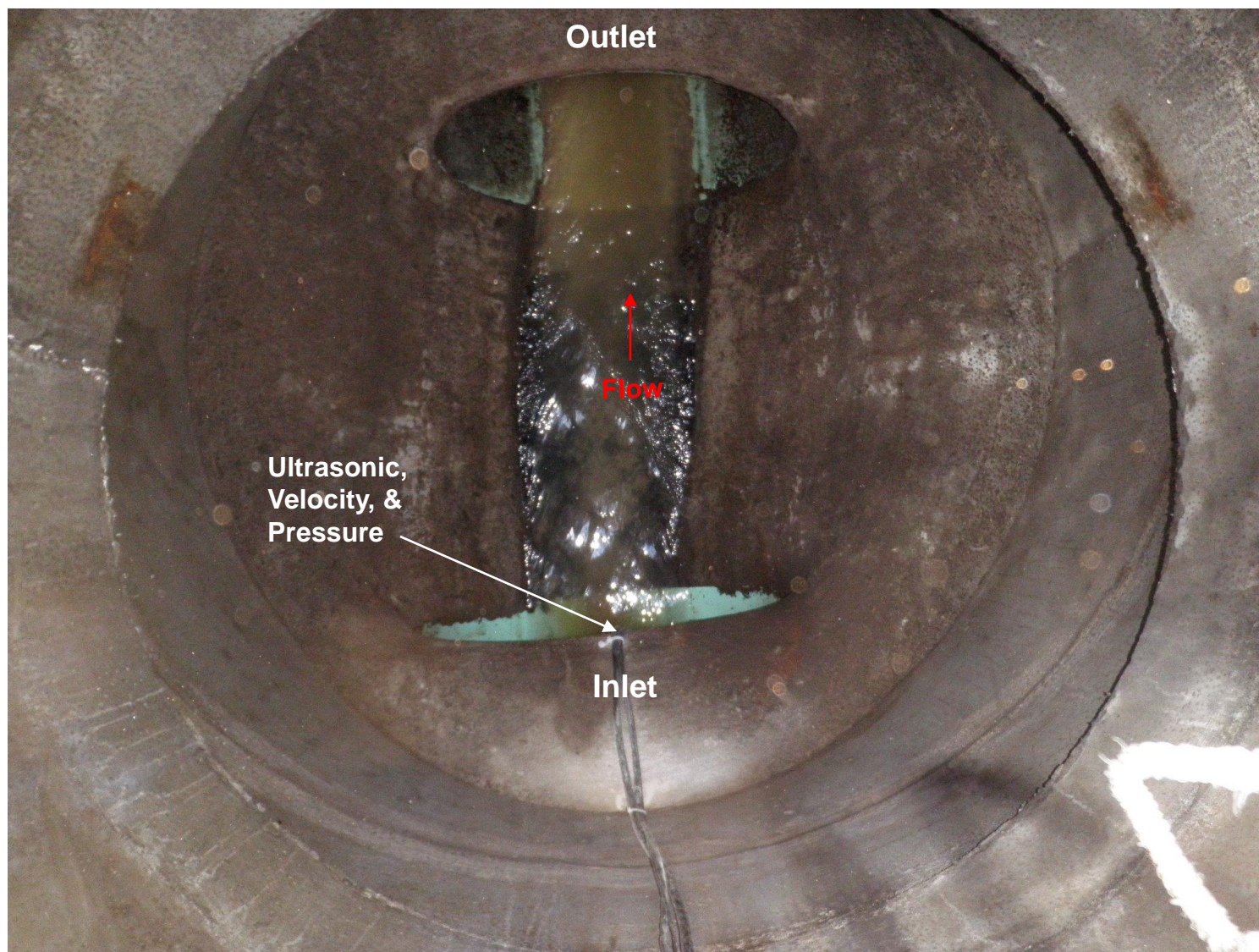
Site access looking north



Bend\_006520

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



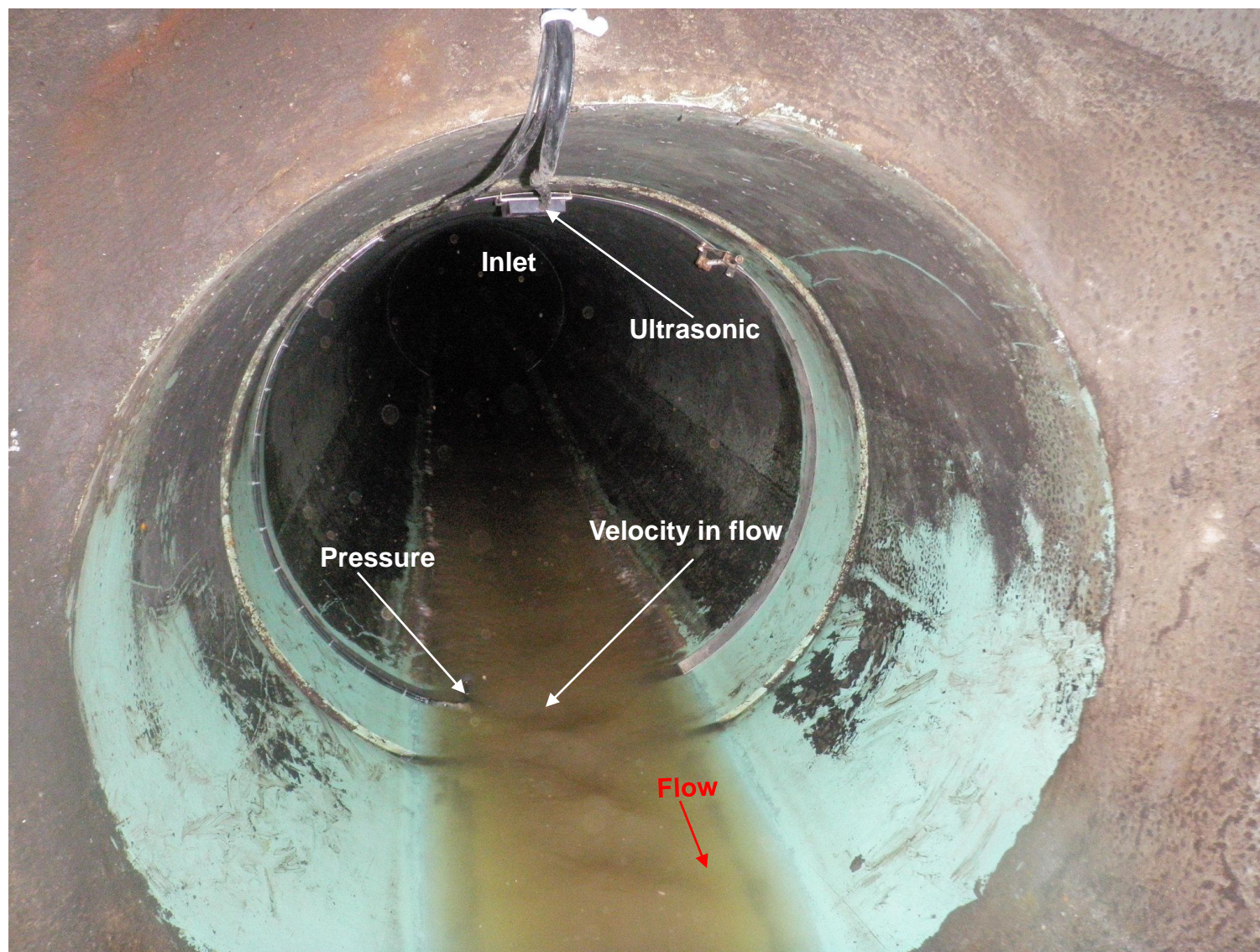
View of site looking north



Bend\_006520

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of inlet and sensors



Bend\_006520

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet



# SCATTERGRAPH REPORT

Bend\_006520

## Flow Monitor

Bend\_006520

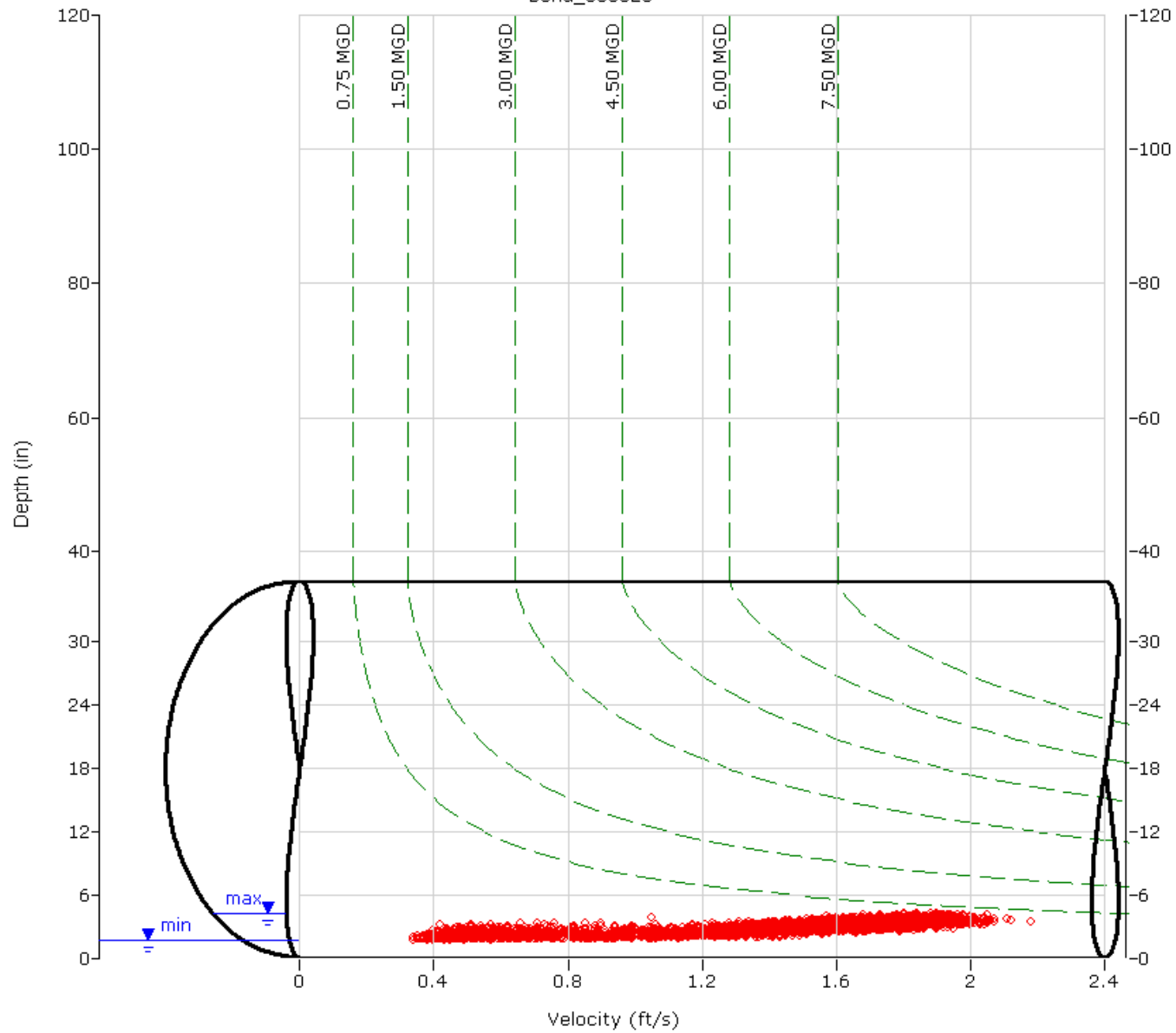
Pipe Height  
35.75 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - Iso-Q™
- - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_006520

## Flow Monitor

Bend\_006520

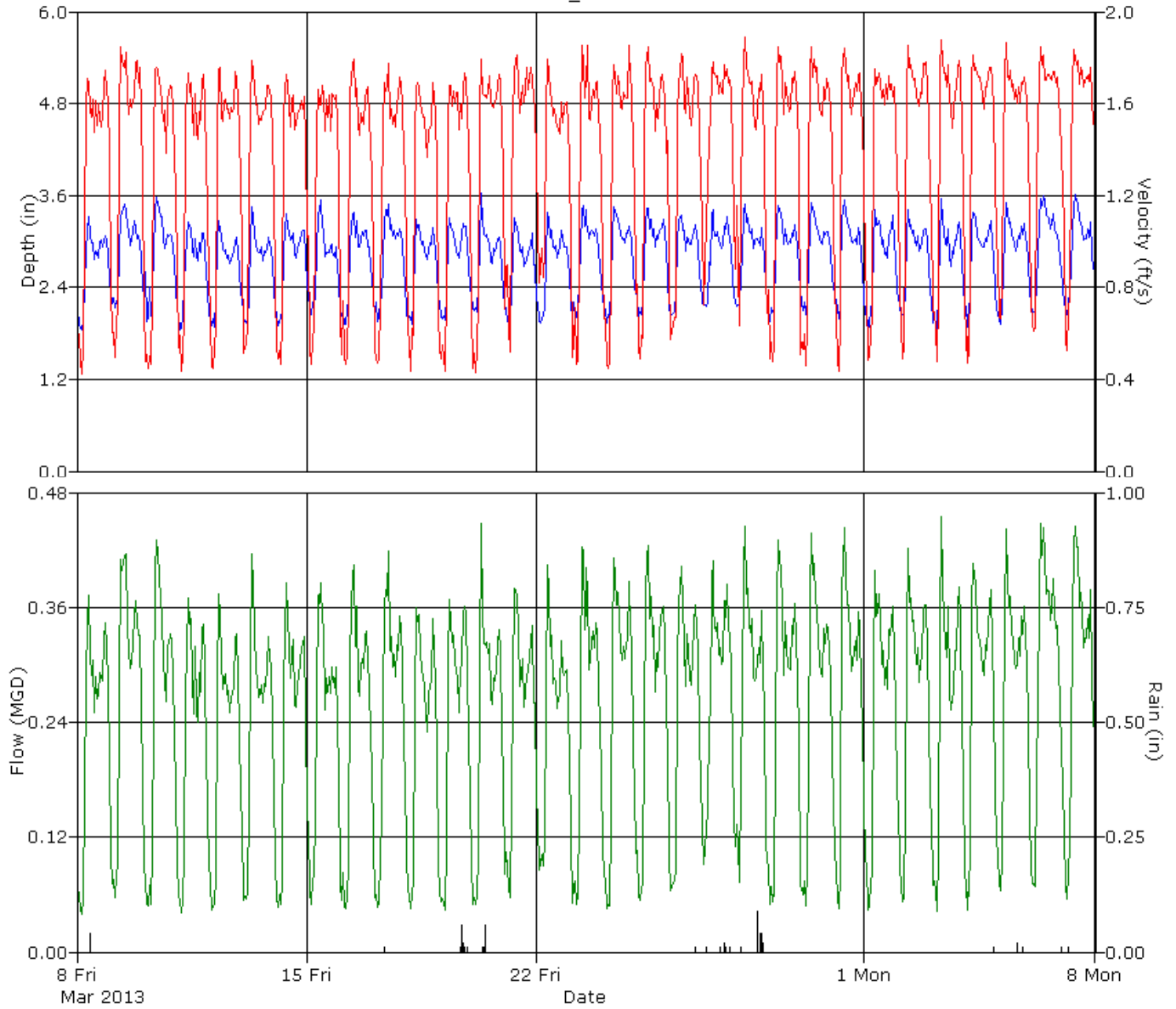
Pipe Height  
35.75 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_006816	
Measured Pipe Height (in)	7.88
Nominal Pipe Height (in)	8
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_006816 was located in the Northeast of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a fairly repeatable data set with slow moving flow (<1.25 ft/s). The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 10%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.76	0.62	0.025
Minimum	0.57	0.18	0.002
Maximum	2.96	1.26	0.086
Time of Minimum	3/20/2013 4:15 AM	3/11/2013 1:40 PM	3/19/2013 2:20 AM
Time of Maximum	3/15/2013 7:05 AM	3/14/2013 11:20 AM	3/15/2013 7:05 AM

### Data Quality

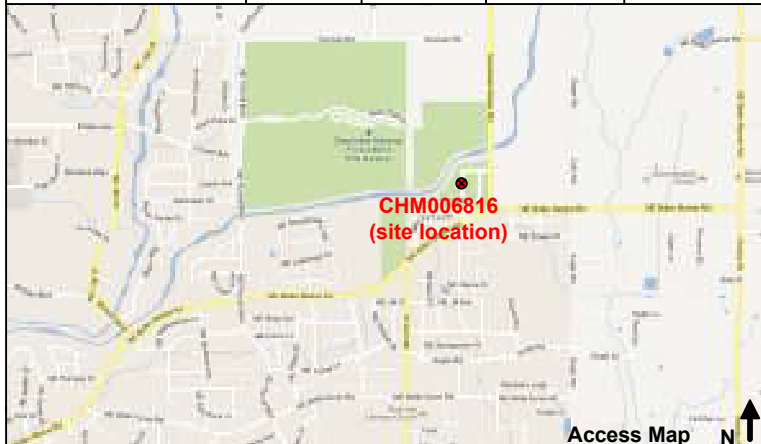
The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Invalid velocity data as a result of sensor malfunction were flagged from the data set (March 8 - 12, 2013).

Percent Uptime (%)	
Depth	98
Velocity	90
Quantity	90



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_006816		Monitor Series: 5000 AG		Monitor S/N: 21730	
Address/Location: NE Amherst Pl & Waterford Ct		Manhole #		CMH006816	
		Coordinates:		44°05'18.56"N 121°15'37.20"W	
		Pipe Height:		7.88"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 7.88"
					IP Address: 166.219.172.53



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/28/13 @ 12:46	Manhole Depth:	~ 8'
Site Hydraulics:	Small waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	Did not investigate	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Did not investigate	Telephone Information:	Doesn't apply
Depth of Flow:	1.50" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	6.38" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	0.75 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.25"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_JRRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
---

5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_006816 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/28/13

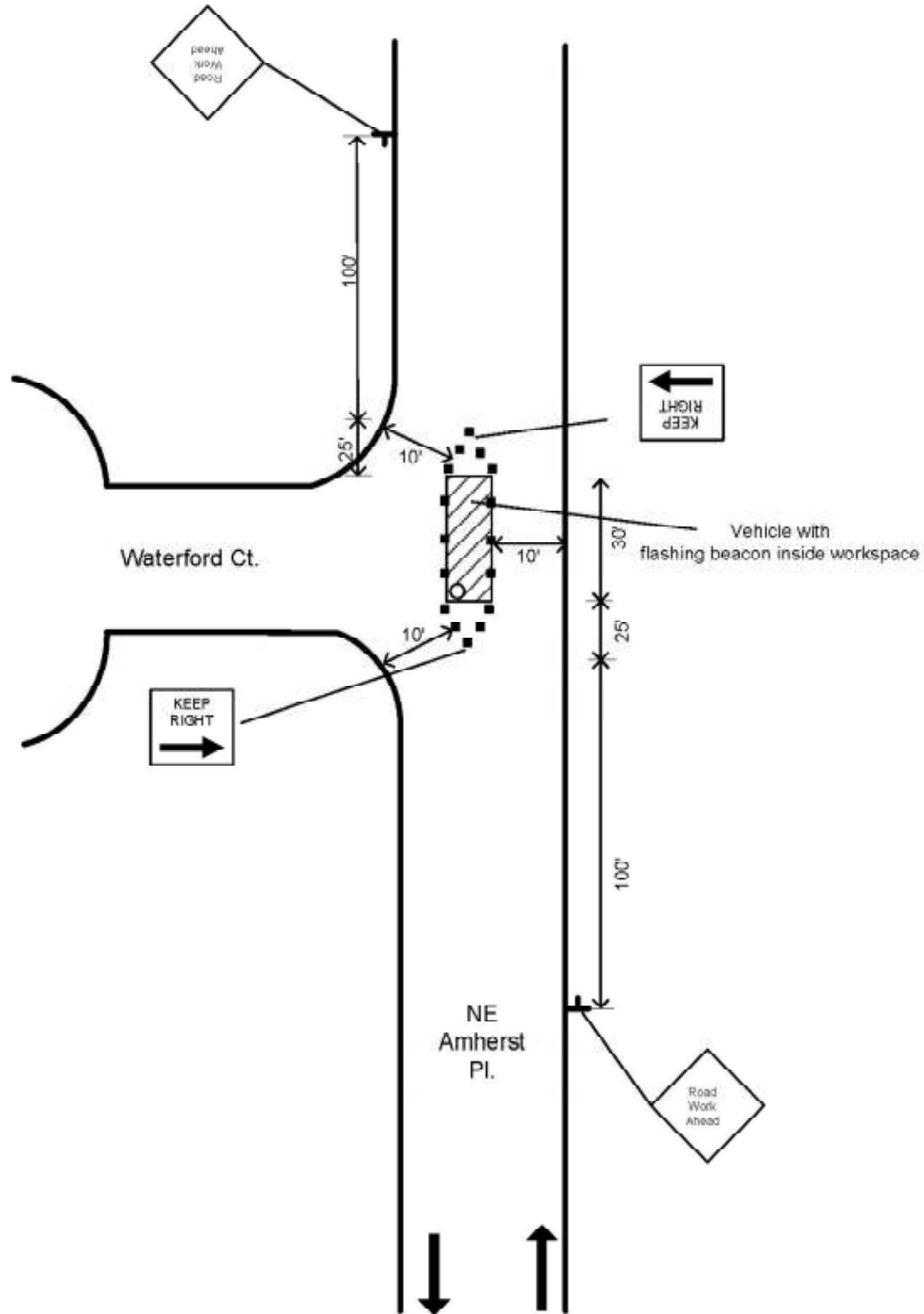
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/28/13





Posted Speed Limit

SPEED  
LIMIT  
**25**

Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

Site Access  
02/27/13-04/13/13  
7:00am-5:00pm



Bend\_006816

Site location

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SERVICES®**



Site access

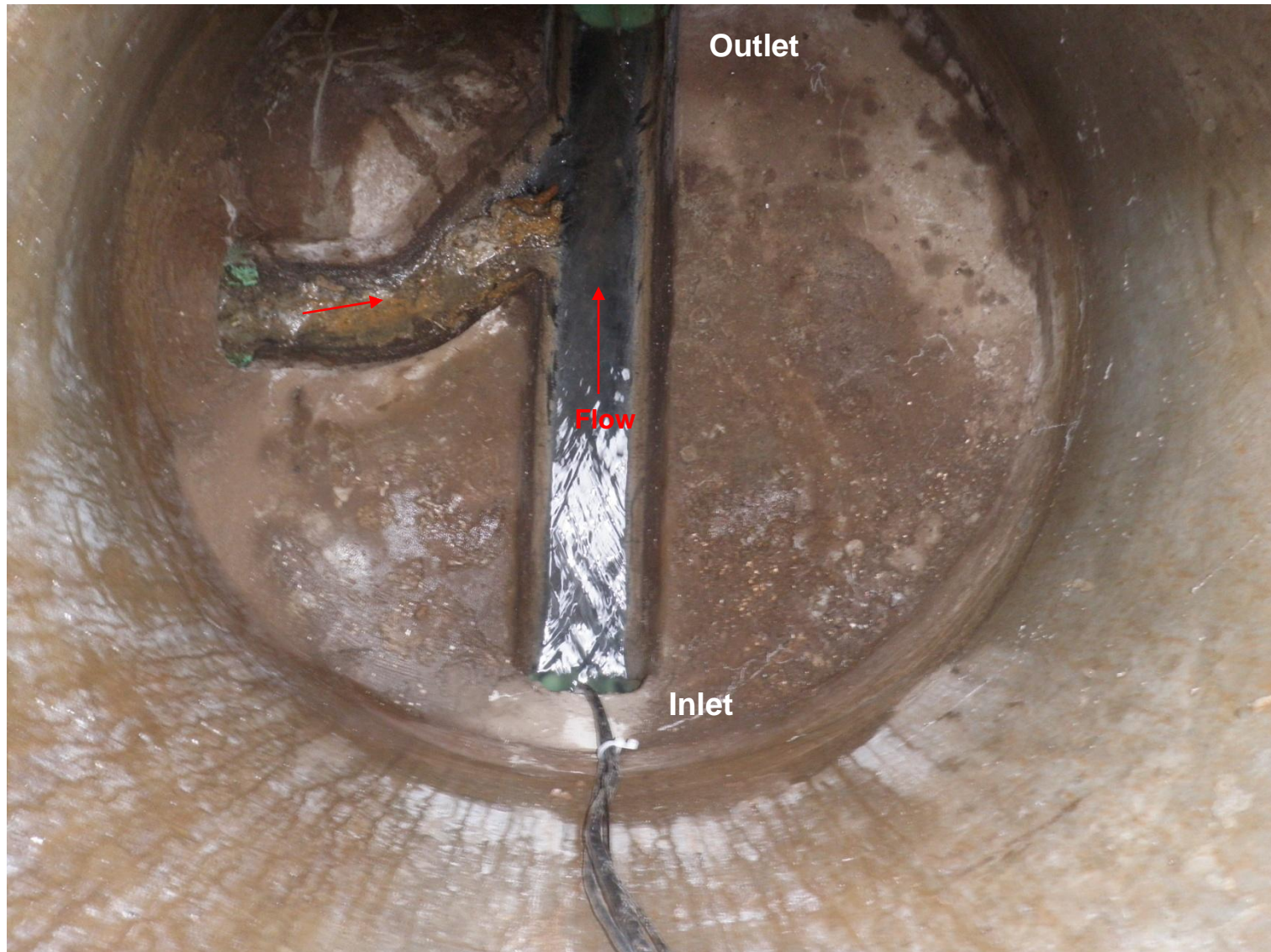
Site access looking northwest



Bend\_006816

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



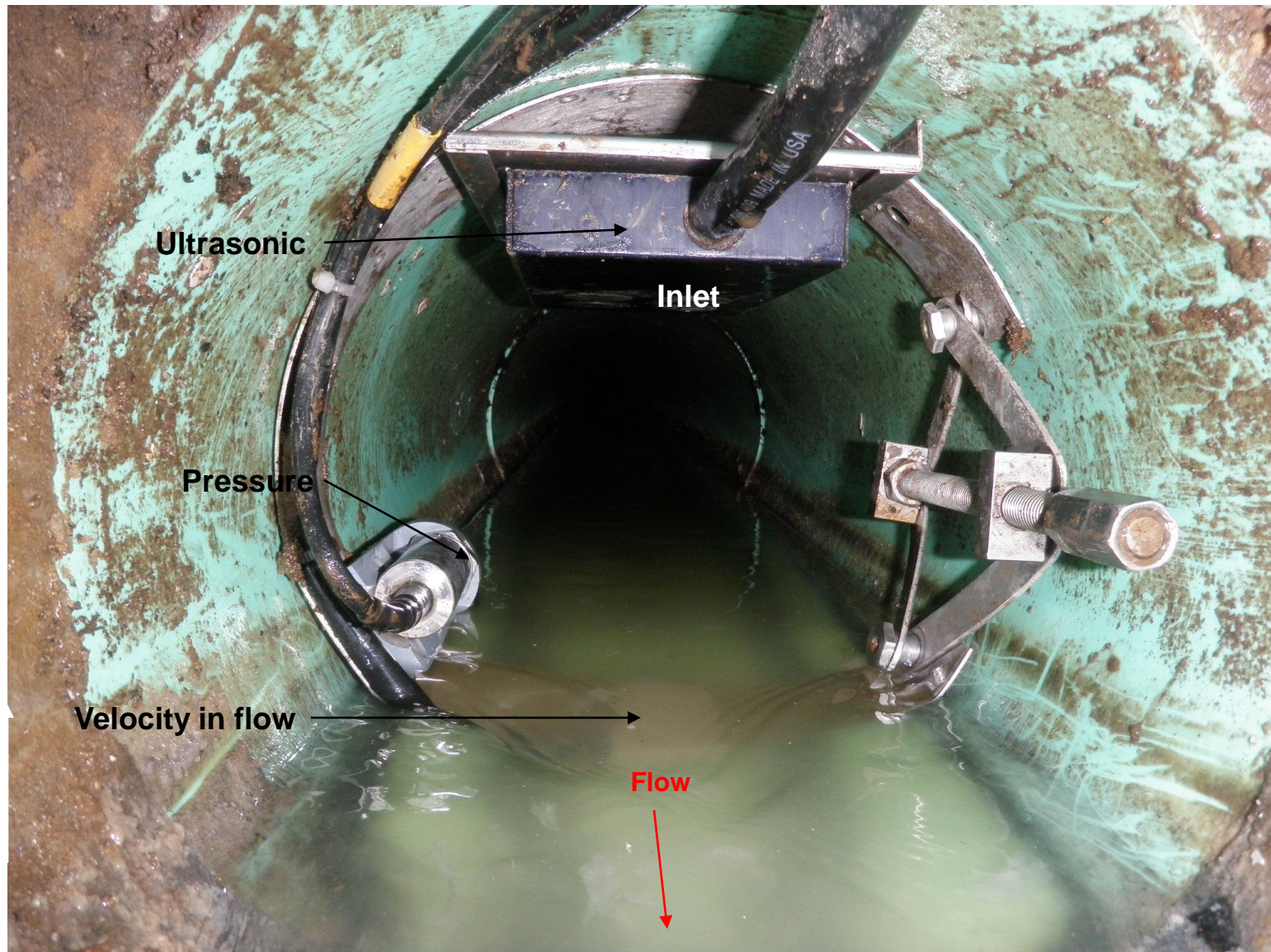
View down manhole facing north



Bend\_006816

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of sensor placement and site hydraulics



Bend\_006816

Site outlet



**View of outlet and hydraulics**



# SCATTERGRAPH REPORT

Bend\_006816

## Flow Monitor

Bend\_006816

Pipe Height  
7.88 in

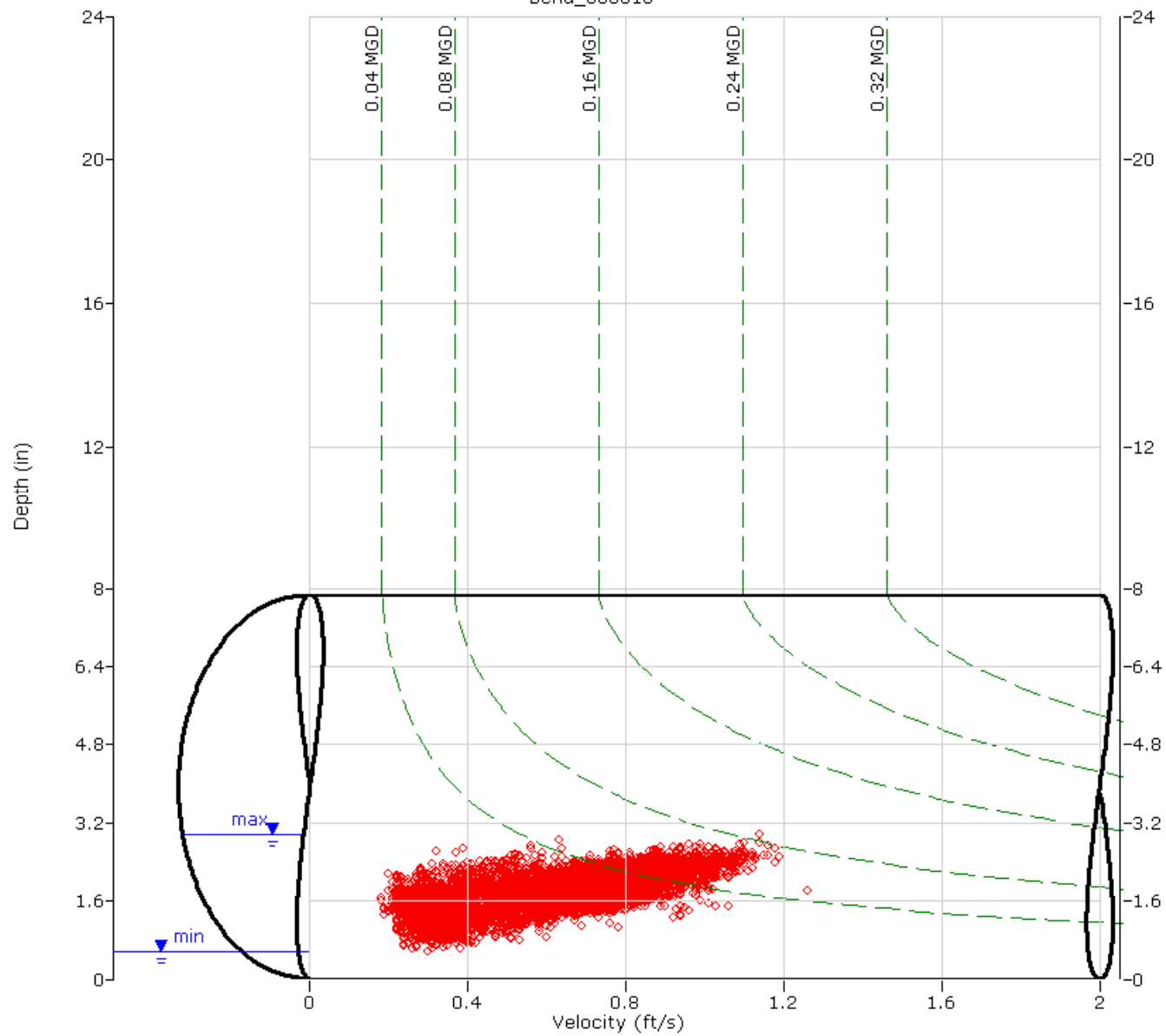
## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth

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# HYDROGRAPH REPORT

Bend\_006816

## Flow Monitor

Bend\_006816

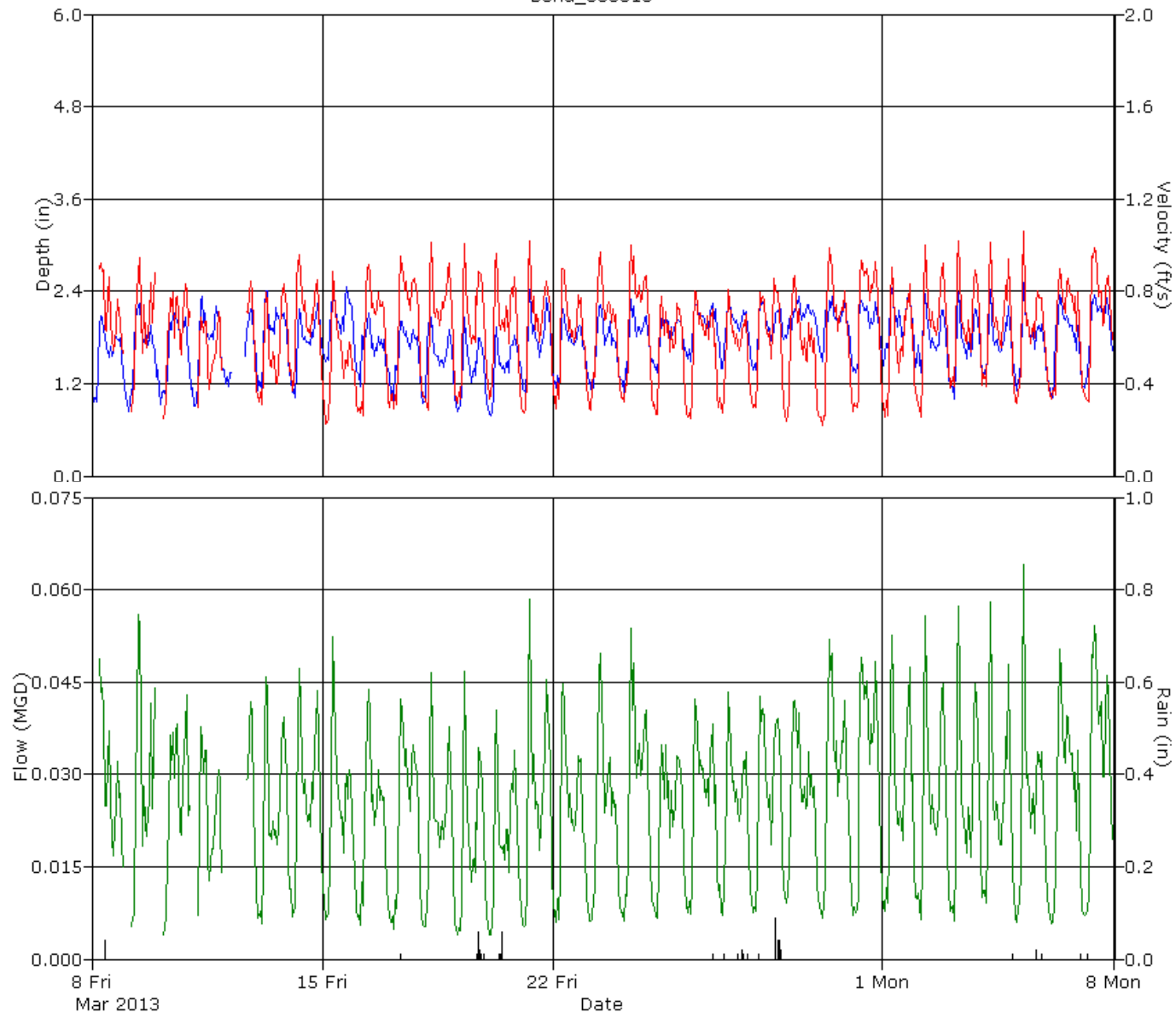
Pipe Height  
7.88 in.

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





---

## Site Commentary

---

### Site Information

BEND_007682	
Measured Pipe Height (in)	7.88
Nominal Pipe Height (in)	8
Silt Level (in)	0.00

### Overview

Monitoring point BEND\_007682 was located in the Northeast of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a fairly repeatable data set with slow moving flow (<1.25 ft/s). The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 10%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.68	0.70	0.034
Minimum	0.88	0.20	0.004
Maximum	2.97	1.40	0.131
Time of Minimum	4/5/2013 4:25 AM	4/3/2013 4:15 AM	3/10/2013 4:35 AM
Time of Maximum	3/31/2013 12:50 PM	4/7/2013 11:05 AM	3/9/2013 8:50 AM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Invalid velocity data as a result of sensor malfunction were flagged from the data set (March 8 - 12, 2013).

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Bend\_007682

Site location

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Site access looking southeast



Bend\_007682

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



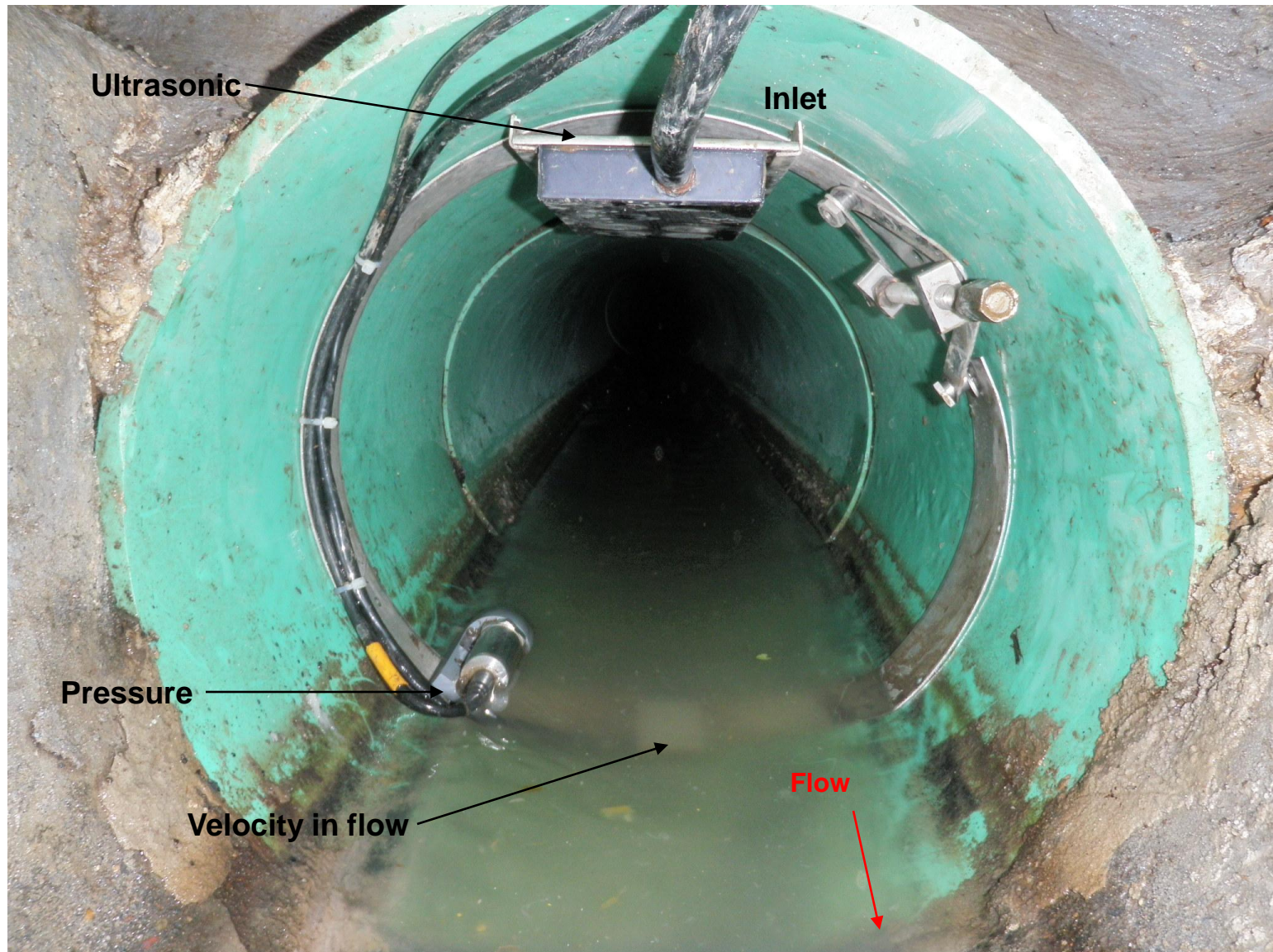
View down manhole facing north



Bend\_007682

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



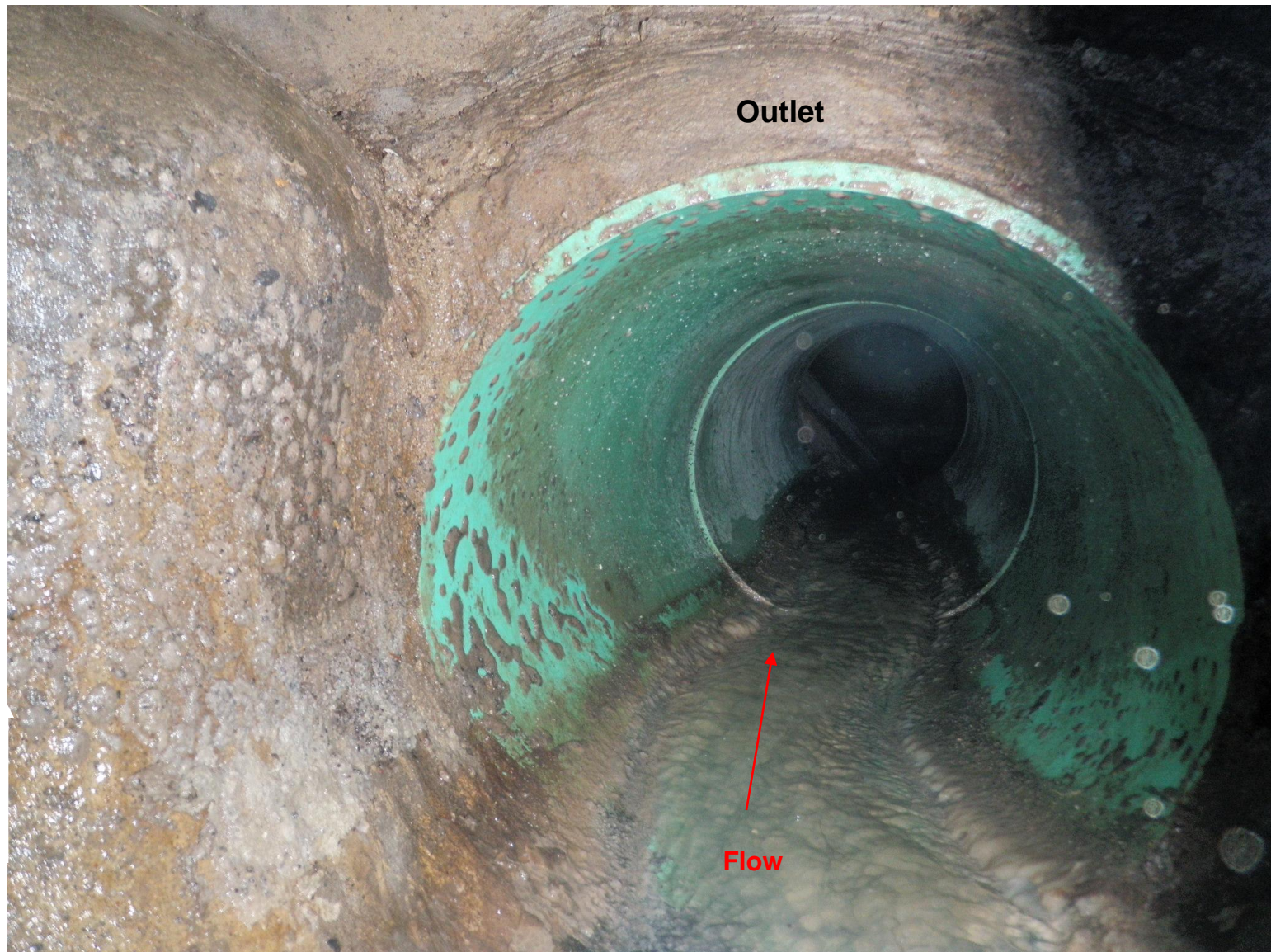
View of sensor placement and site hydraulics



Bend\_007682

Site outlet

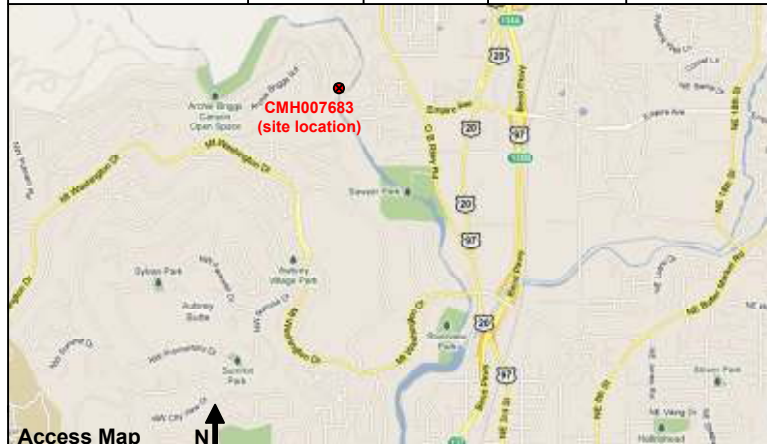
**ADS ENVIRONMENTAL  
SERVICES®**



View of outlet and hydraulics



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_007682		Monitor Series: 5000 AG		Monitor S/N: 20007	
Address/Location: East of Lower Village Rd. off shoulder of north side of Archie Briggs Rd.		Manhole #: CMH007682		Coordinates: 44° 5'32.74"N 121°19'03'63"W	
Access: Drive		Type of System: Sanitary <input checked="" type="checkbox"/> Storm <input type="checkbox"/> Combined <input type="checkbox"/>		Pipe Height: 11.63"	
				Pipe Width: 11.75"	
				IP Address: 166.219.172.46	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/19/2013 @ 12:45	Manhole Depth:	~ 9'
Site Hydraulics:	Ripples	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No influences	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	1.75" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	9.88" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	0.88 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultrasonic, Velocity, Pressure	Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height:	None Observed	WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	Bend_JRRG	Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
---

5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_007682 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

.Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☒ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/19/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/19/13



# SCATTERGRAPH REPORT

BEND\_007682

## Flow Monitor

BEND\_007682

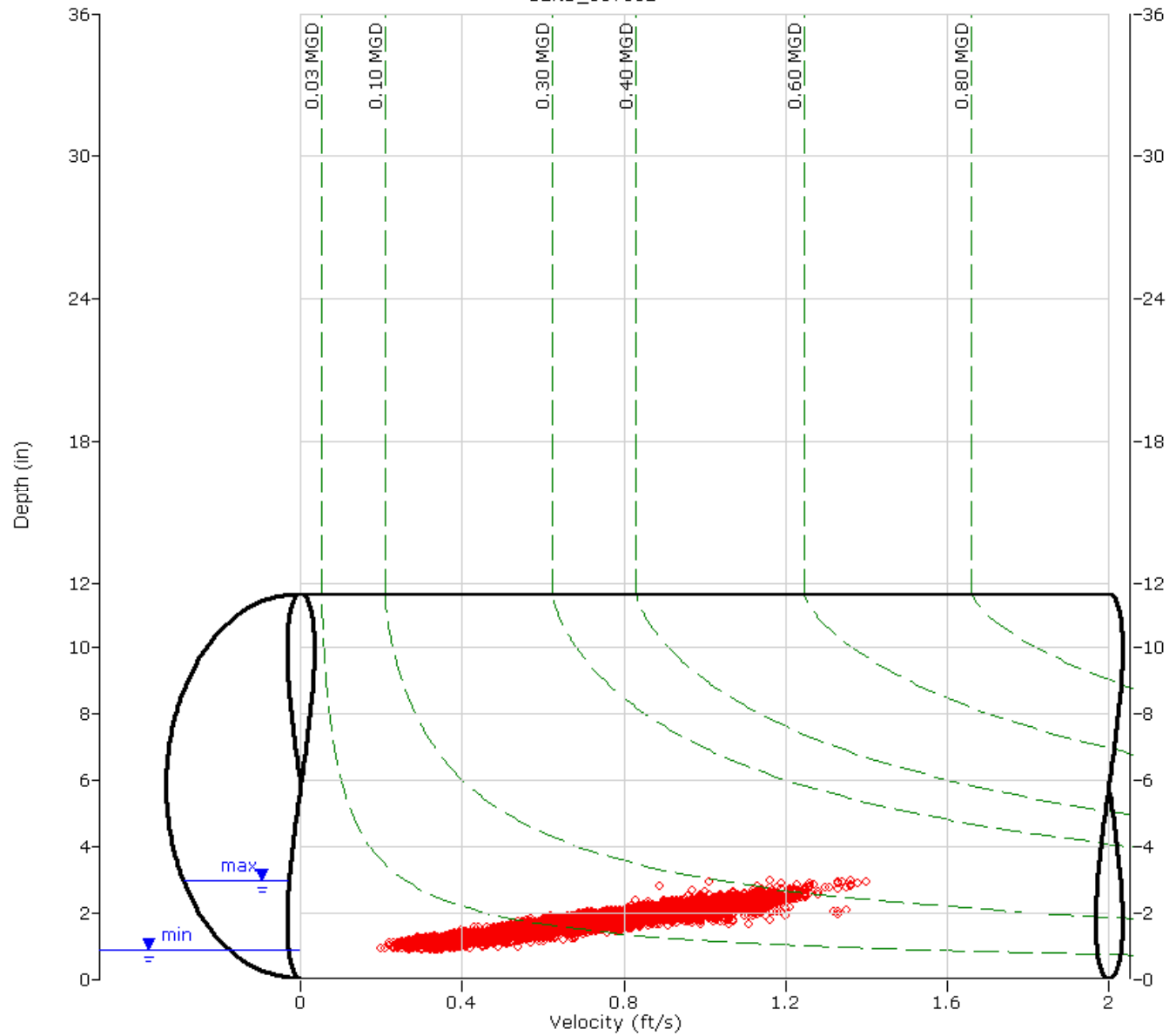
Pipe Height  
11.63 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

BEND\_007682

## Flow Monitor

BEND\_007682

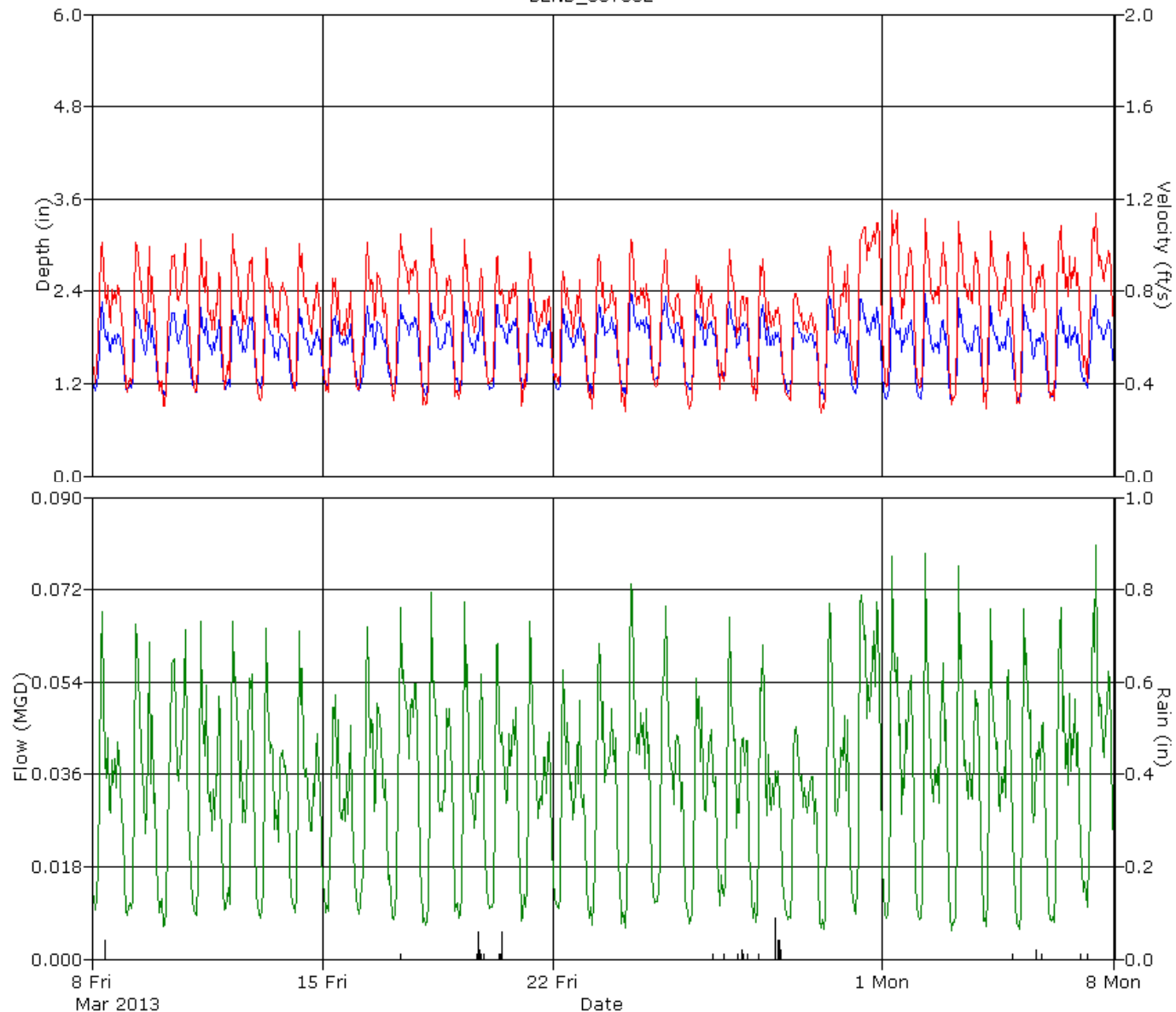
Pipe Height  
11.63 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





---

## Site Commentary

---

### Site Information

Bend_007995	
Measured Pipe Height (in)	27
Nominal Pipe Height (in)	27
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_007995 was located in the Northeast of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern with lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	6.64	2.54	1.317
Minimum	3.76	1.43	0.320
Maximum	9.20	3.44	2.611
Time of Minimum	4/6/2013 4:40 AM	3/19/2013 3:50 AM	3/24/2013 5:40 AM
Time of Maximum	3/16/2013 11:35 AM	4/4/2013 8:35 AM	3/16/2013 11:35 AM

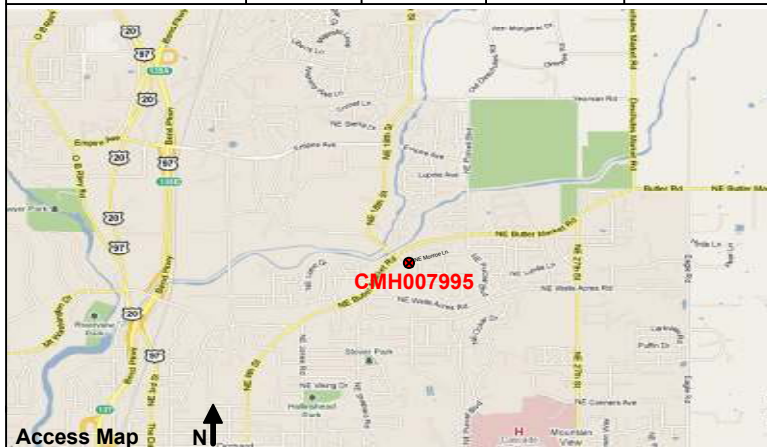
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	85
Velocity	85
Quantity	85



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_007995		Monitor Series: 5000 AG		Monitor S/N: 20008	
Address/Location: Intersection of NE Yellowstone Ln. and NE Crackler Ln.		Manhole #		CMH007995	
		Coordinates:		44°04'53.35" N 121°16'43.35" W	
		Pipe Height:		27.00"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 27.00"
					IP Address: 166.219.172.42



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/22/13 @14:22	Manhole Depth:	~ 12'
Site Hydraulics:	Smooth, standing waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No influence	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	7.00" +/- .25"	Access Pole #:	Doesn't apply
Range (Air DOF):	20.00" +/- .25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	3.08 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultrasonic, Velocity, Pressure	Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height:	None Observed	WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	JRRG	Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
---

15 psi pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_007995 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/22/13

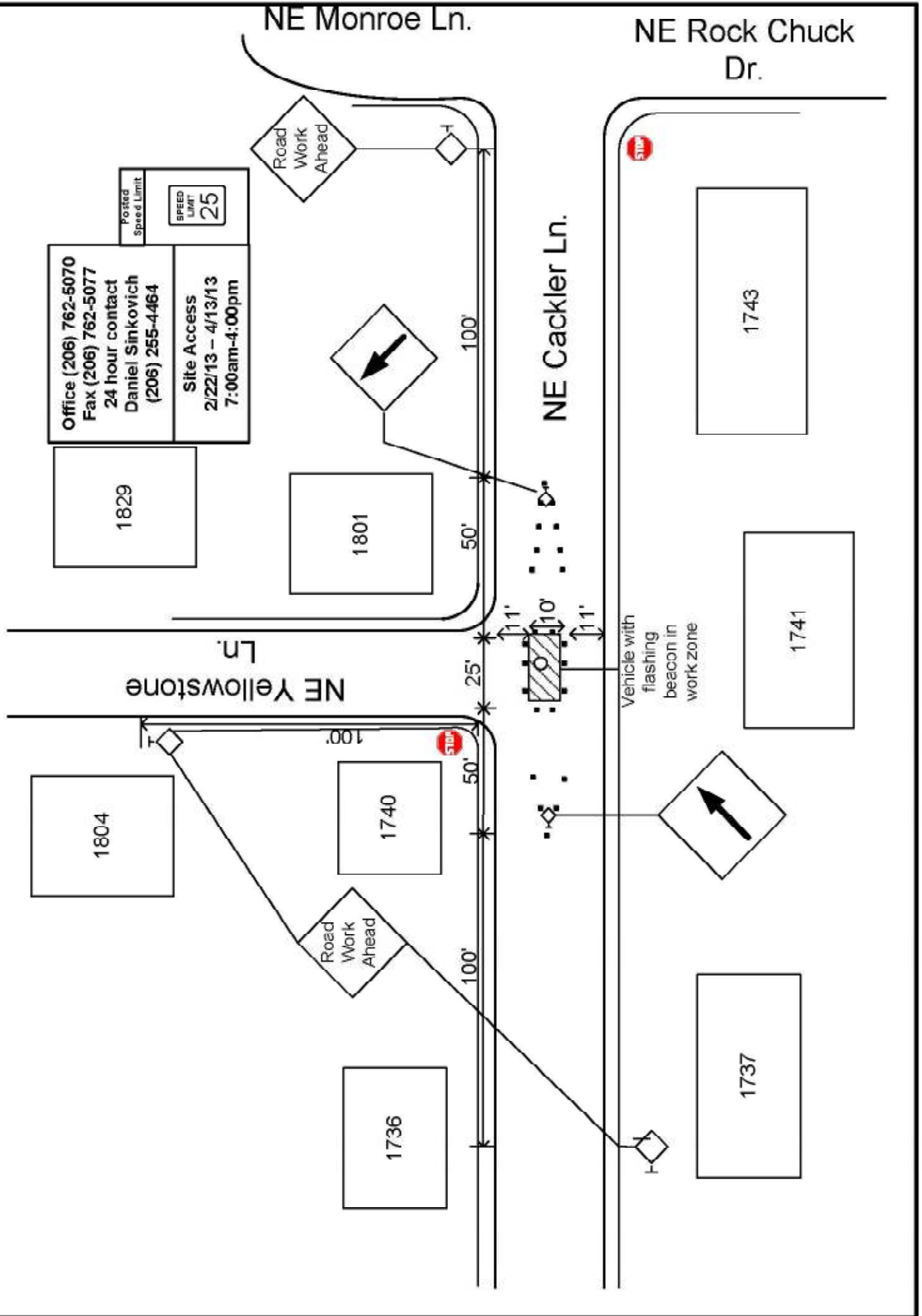
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/22/13







Bend\_007995

Site location

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Site access

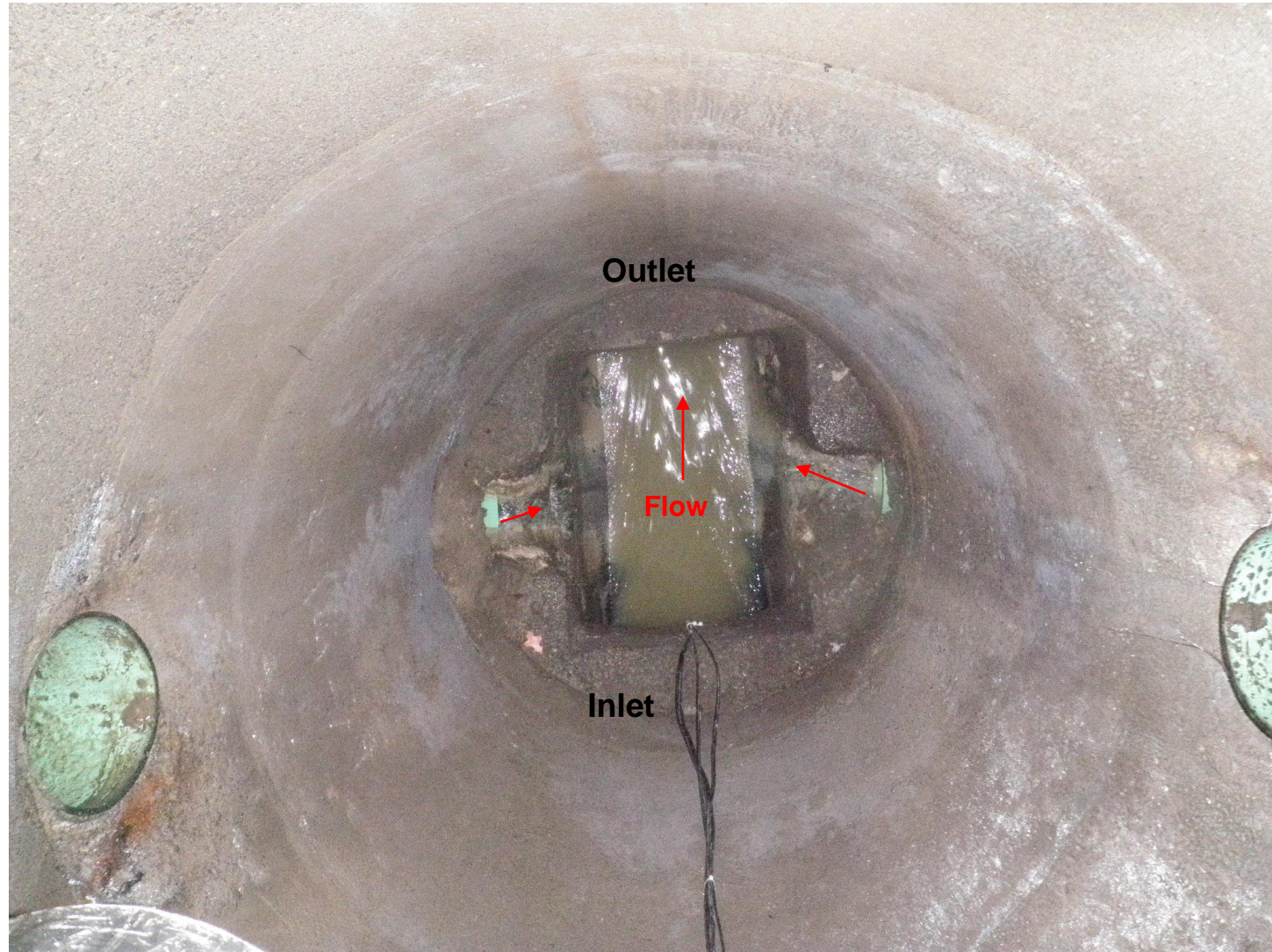
Site access looking southwest



Bend\_007995

Site set up

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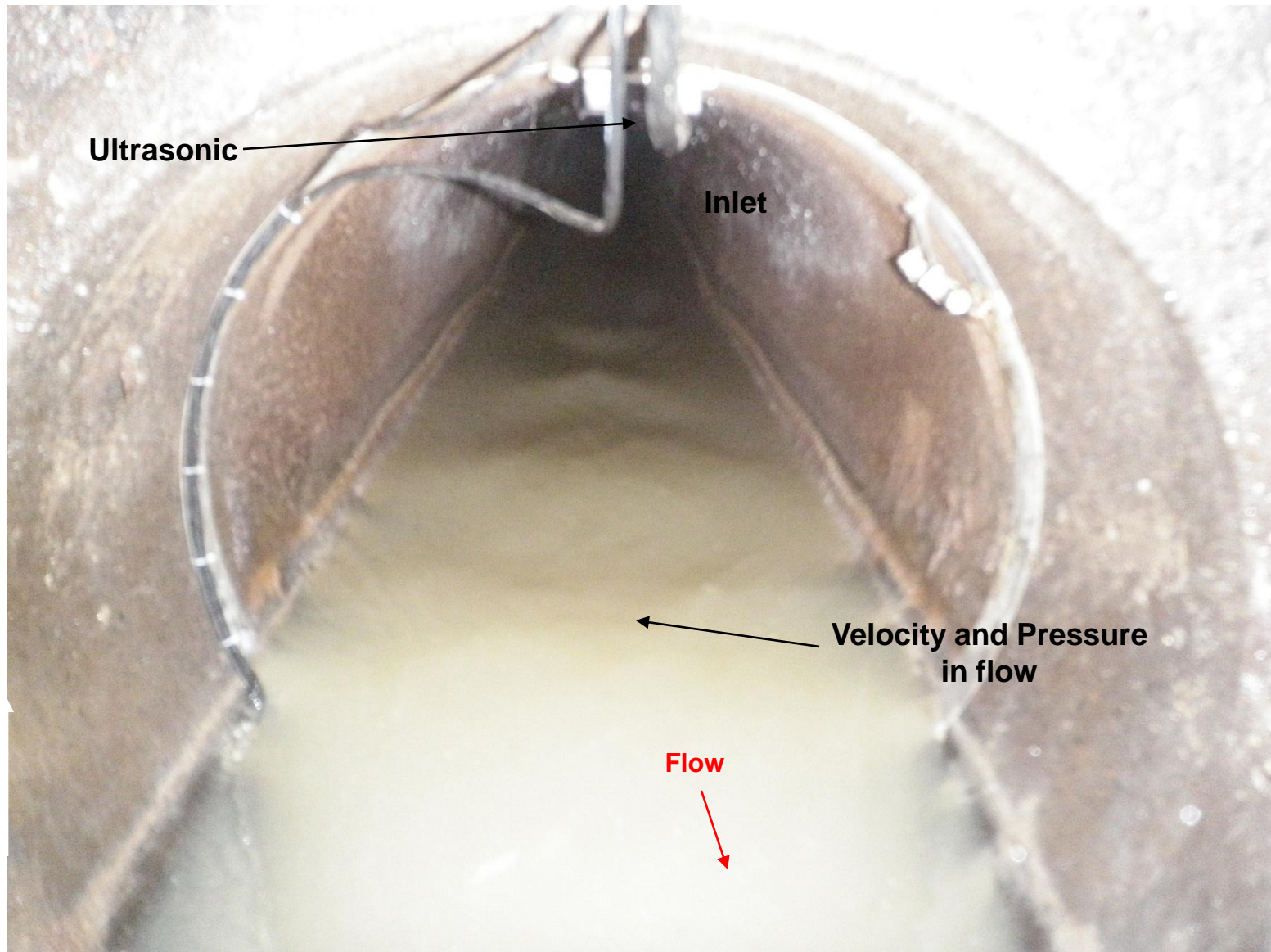
View down manhole facing north



Bend\_007995

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



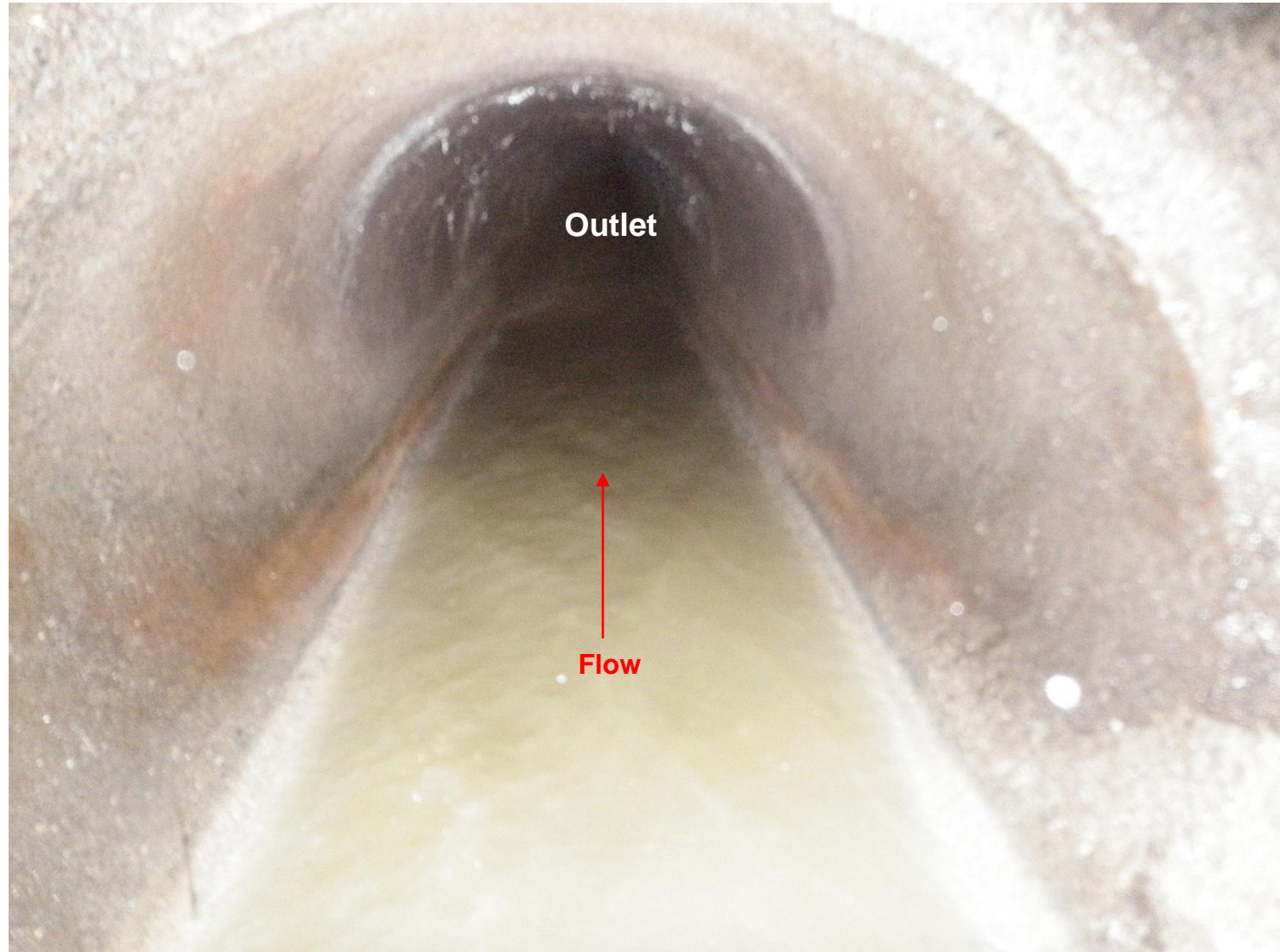
View of sensor placement and site hydraulics



Bend\_007995

Site outlet

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View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_007995

## Flow Monitor

Bend\_007995

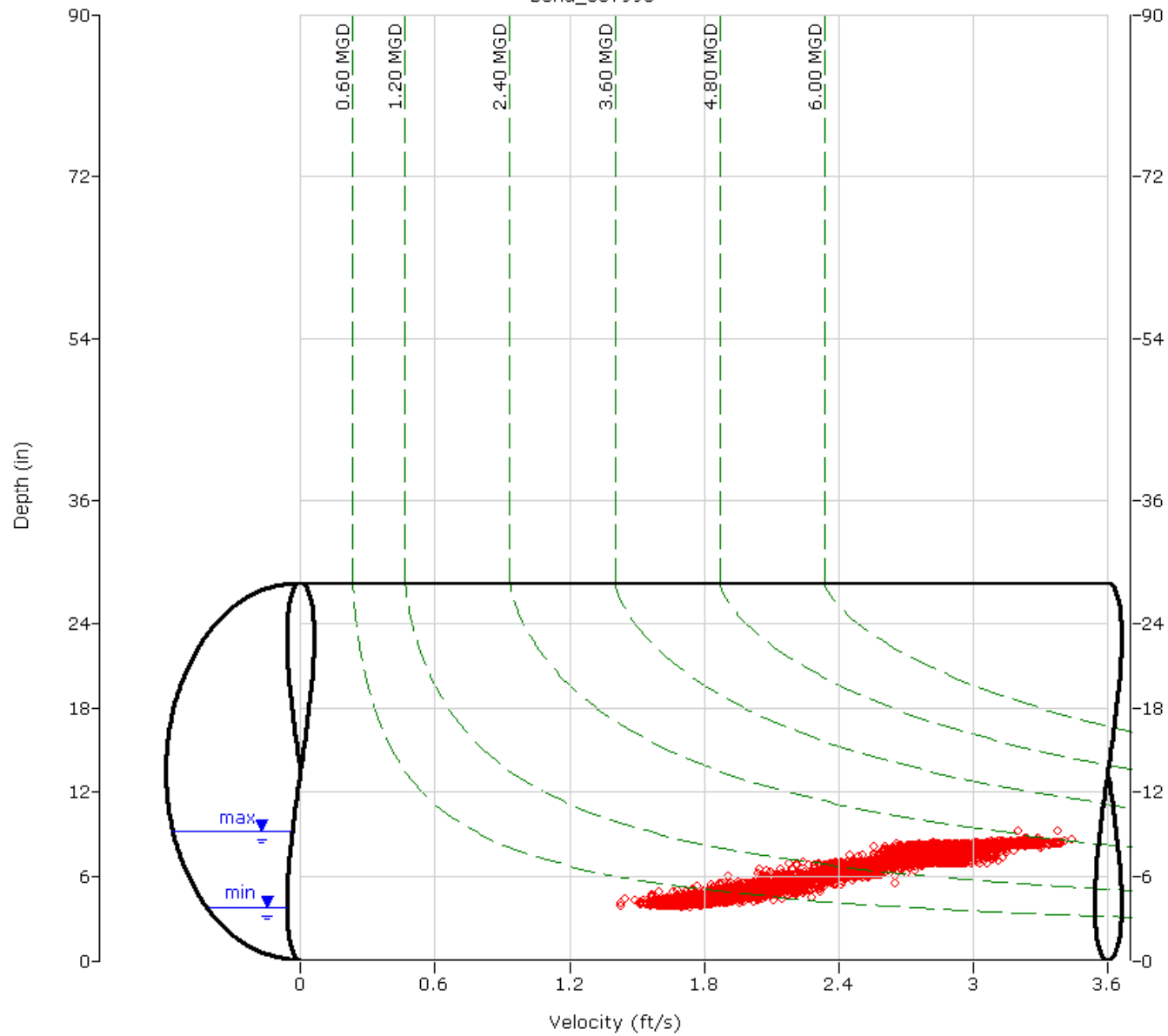
Pipe Height  
27.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_007995

## Flow Monitor

Bend\_007995

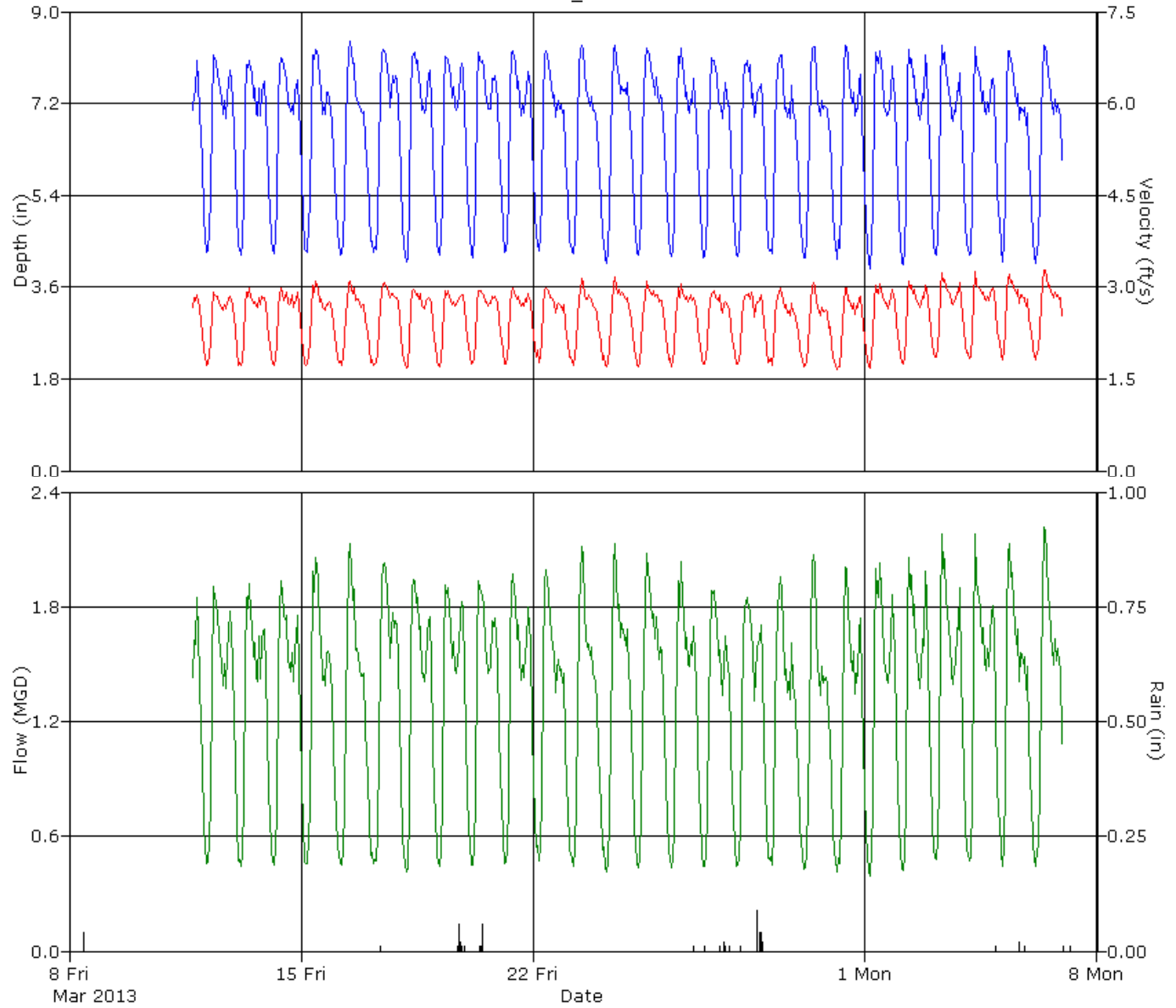
Pipe Height  
27.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_007997	
Measured Pipe Height (in)	11.88
Nominal Pipe Height (in)	12
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_007997 was located in the East of Bend (see attached site report for details). Originally this site was to be monitored at CMH007996, but that location had a hydraulic jump. The data for this location begins on March 26, 2013.

The hydrograph indicates a residential diurnal flow pattern during the period Tuesday, March 26, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a fairly repeatable data set with frequent hydraulic shifting. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 8%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Tuesday, March 26, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.97	1.73	0.263
Minimum	1.90	1.06	0.054
Maximum	5.72	2.49	0.554
Time of Minimum	4/3/2013 3:50 AM	4/4/2013 3:40 AM	4/3/2013 3:50 AM
Time of Maximum	4/2/2013 8:10 AM	4/6/2013 11:30 AM	4/6/2013 11:30 AM

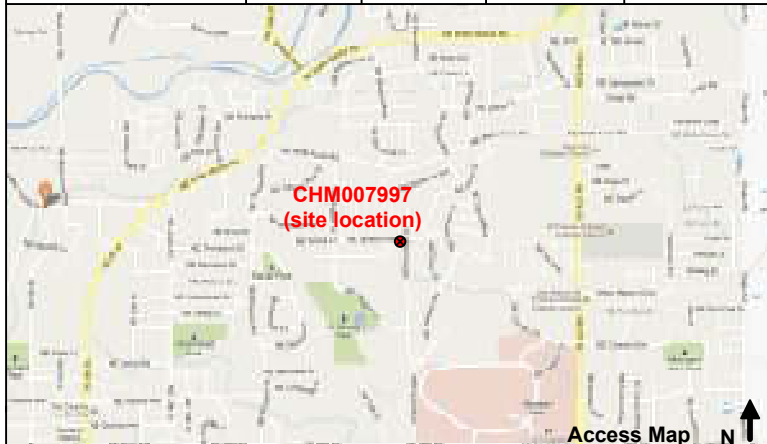
### Data Quality

The data uptime for the Tuesday, March 26, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Originally this site was to be monitored at CMH007996, but that location had a hydraulic jump. The data for this location begins on March 26, 2013. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_007997		Monitor Series: 5000 AG		Monitor S/N: 21547	
Address/Location: NE Jackson Ave. & NE Moonlight Dr.		Manhole #		CMH007997	
		Coordinates:		44°04'29.04"N 121°16'28.17"W	
		Pipe Height:		11.88"	
Access: Drive		Type of System:		IP Address: 166.219.172.59	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>			



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	3/26/13 @ 11:26	Manhole Depth:	~ 12'
Site Hydraulics:	Small waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	Small waves and slight bend	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Small waves	Telephone Information:	Doesn't apply
Depth of Flow:	4.25" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	7.63 +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.98 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Cross Section</p>	<p>Planar</p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_JRRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.12.OR **Site ID:** Bend\_007997 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input checked="" type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only.  
Site is located adjacent to an intersection, follow all Traffic Control Plan procedures.

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☒ Standard Traffic Control Plan TA-15 is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 3/26/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 3/26/13



Bend\_007997

Site Access

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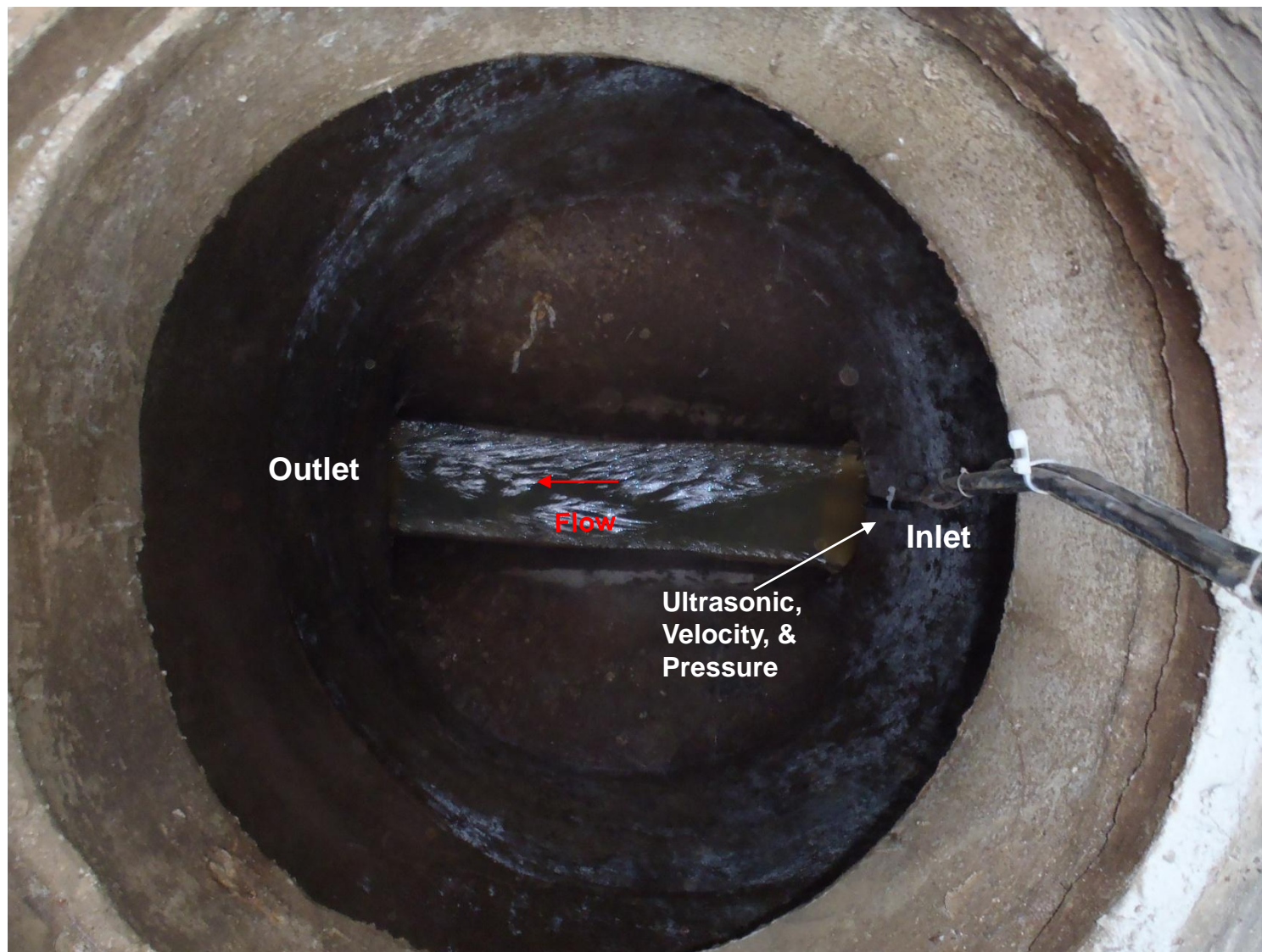
Site access looking northeast



Bend\_007997

Site set up

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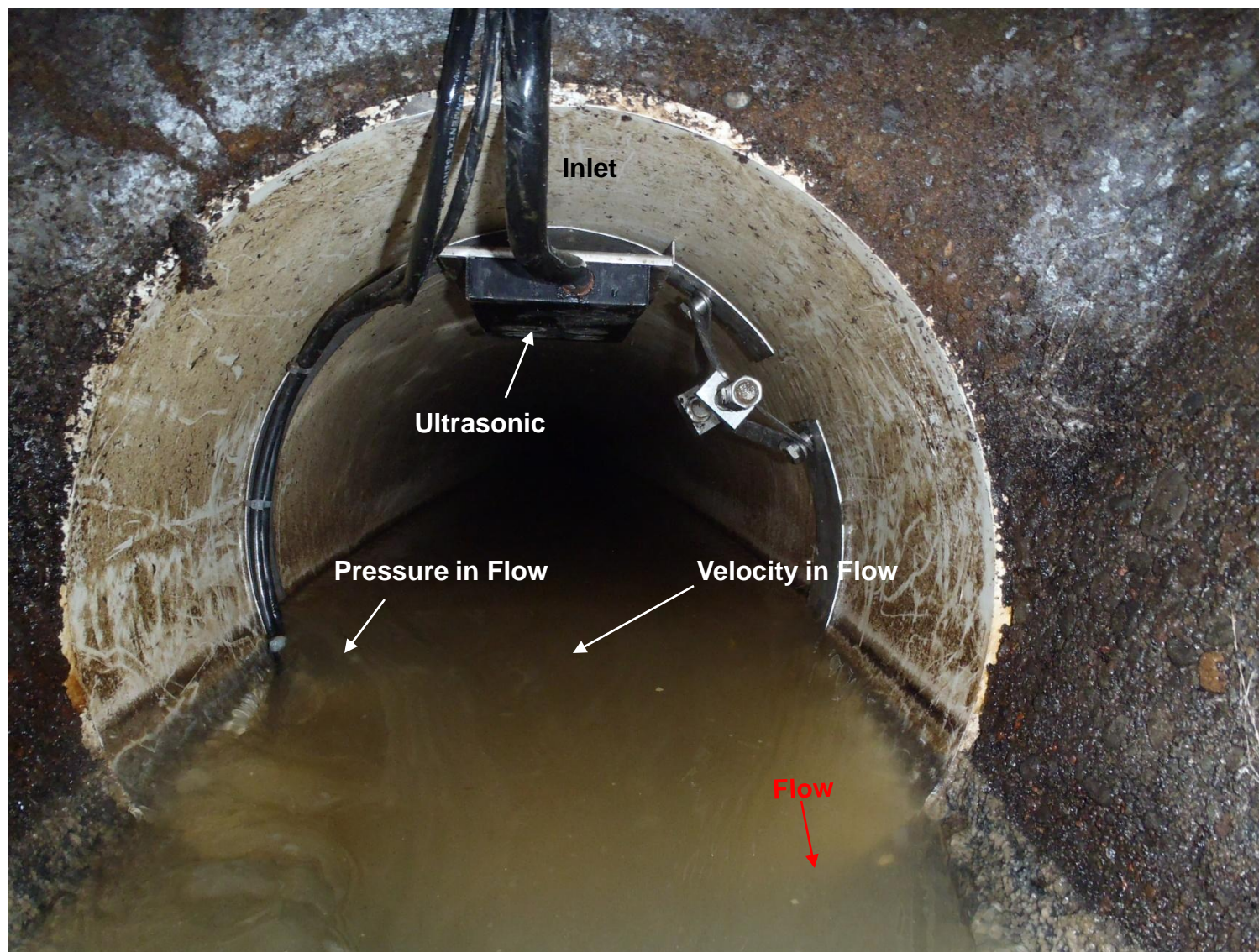
View of site looking north



Bend\_007997

Site set up

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View of inlet and sensors



Bend\_007997

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet



# SCATTERGRAPH REPORT

Bend\_007997

## Flow Monitor

Bend\_007997

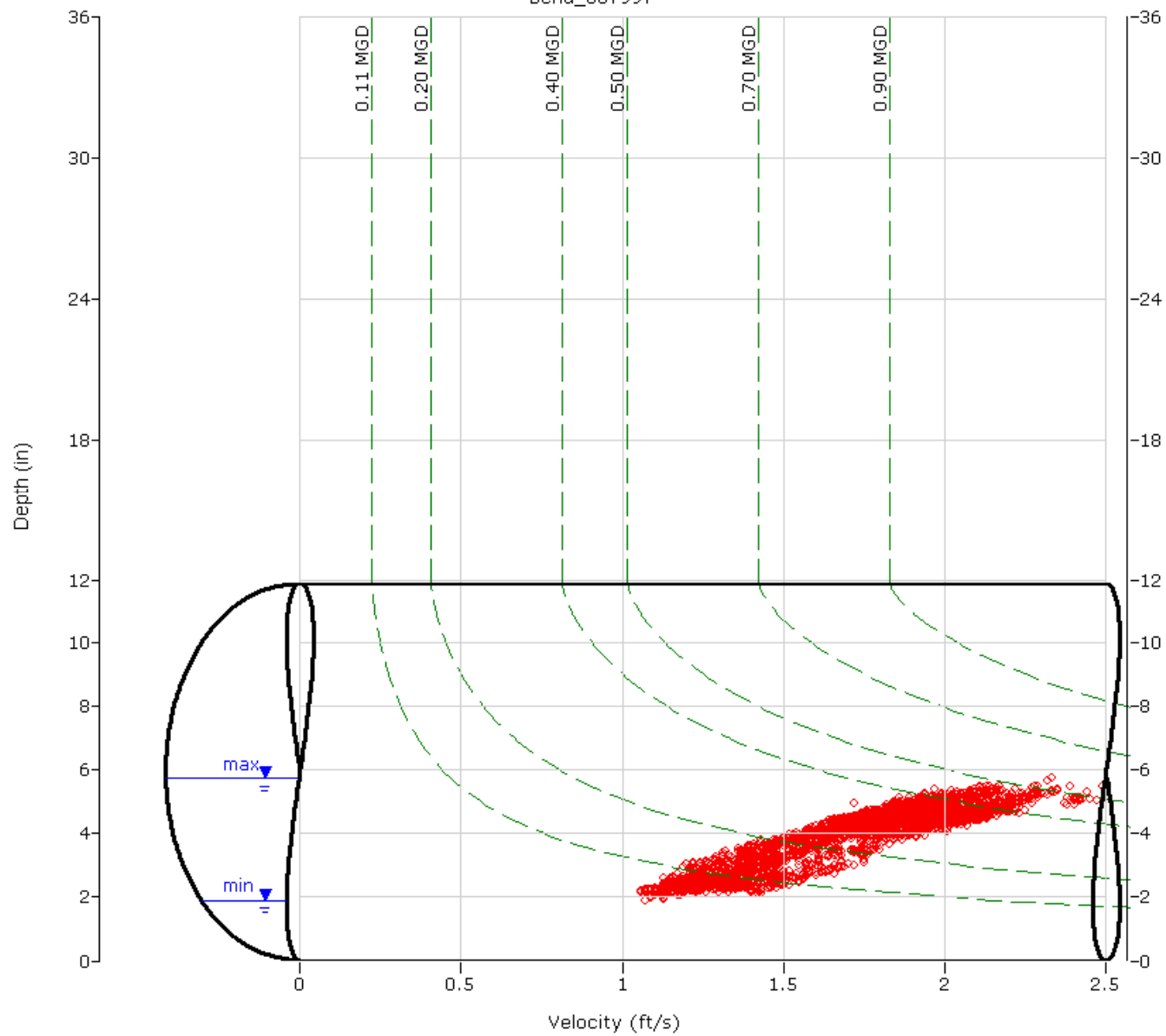
Pipe Height  
11.88 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_007997

## Flow Monitor

Bend\_007997

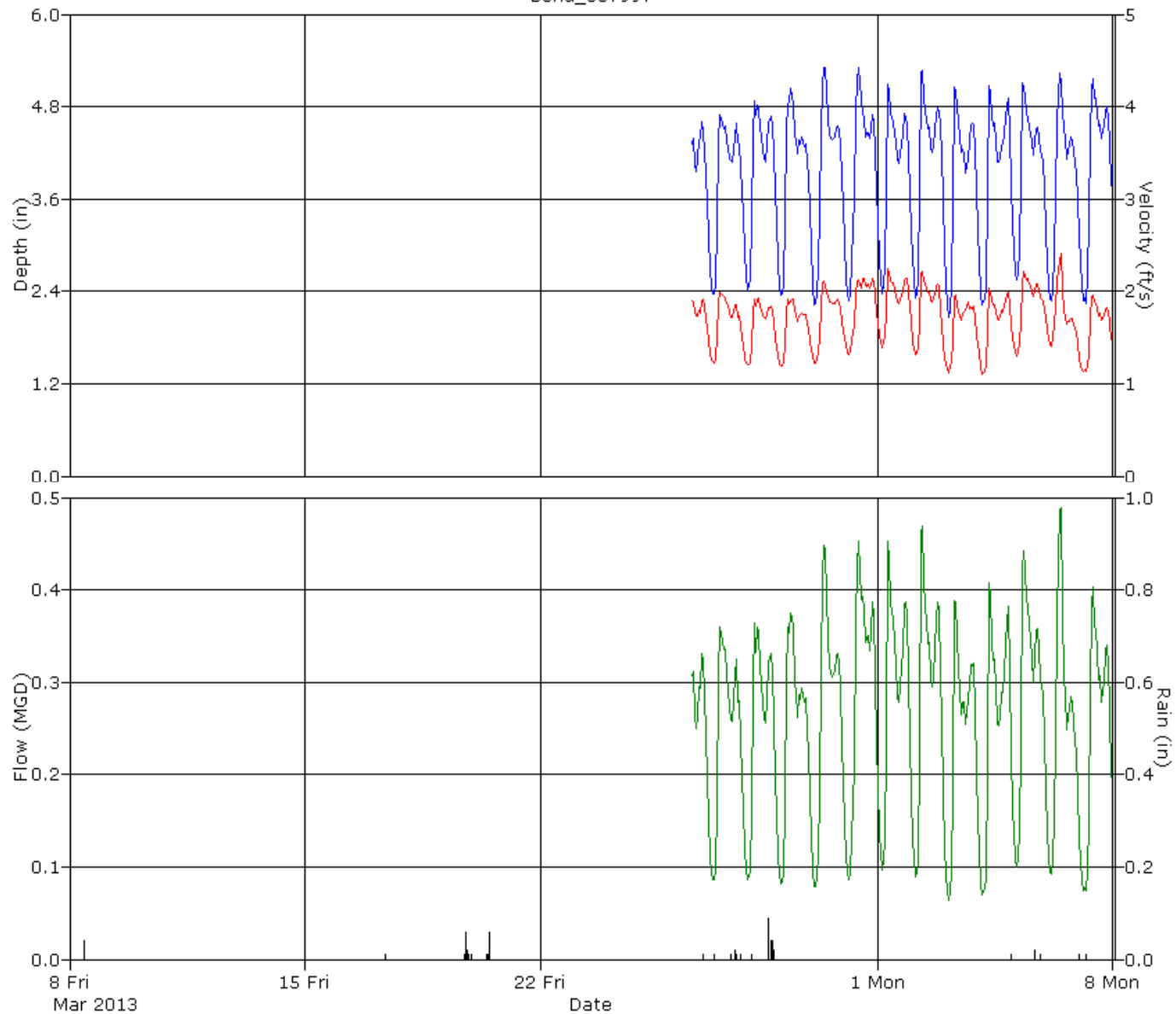
Pipe Height  
11.88 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_008025	
Measured Pipe Height (in)	11.75
Nominal Pipe Height (in)	12
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_008025 was located in the Southwest of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern with lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph indicates a repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 8%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.29	4.91	0.159
Minimum	0.49	1.62	0.013
Maximum	3.18	7.84	0.834
Time of Minimum	3/27/2013 4:50 AM	3/24/2013 5:15 AM	3/24/2013 5:15 AM
Time of Maximum	4/4/2013 9:00 PM	4/4/2013 9:00 PM	4/4/2013 9:00 PM

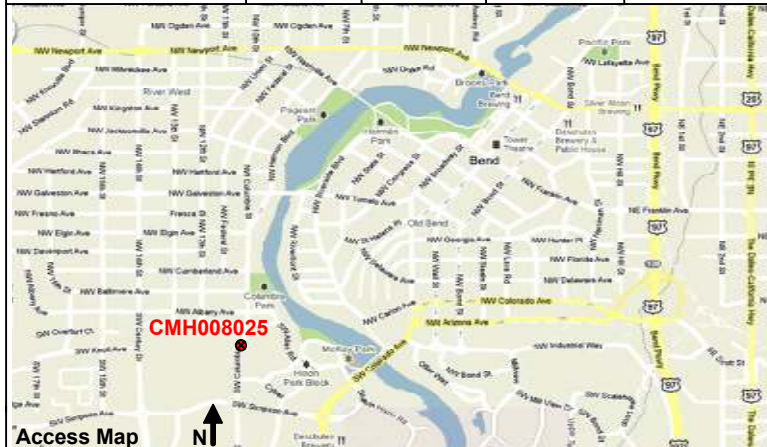
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_008025		Monitor Series: 5000 AG		Monitor S/N: 21126	
Address/Location: 107 SW Columbia St.		Manhole #		CMH008025	
		Coordinates:		44°03'00.43" N, 121°19'37.59" W	
		Pipe Height:		11.75"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 11.75"
					IP Address: 166.219.172.32



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/25/13 @ 8:59	Manhole Depth:	~ 8'
Site Hydraulics:	Ripples, Fast	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No influence	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	2.00" +/- .25"	Access Pole #:	Doesn't apply
Range (Air DOF):	9.75" +/- .25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	6.80 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Cross Section</p>	<p>Planar</p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultrasonic, Velocity, Pressure	Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height:	None Observed	WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	Bend_RWRG	Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:	
5 psi pressure used at this location	



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_008025 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/25/13

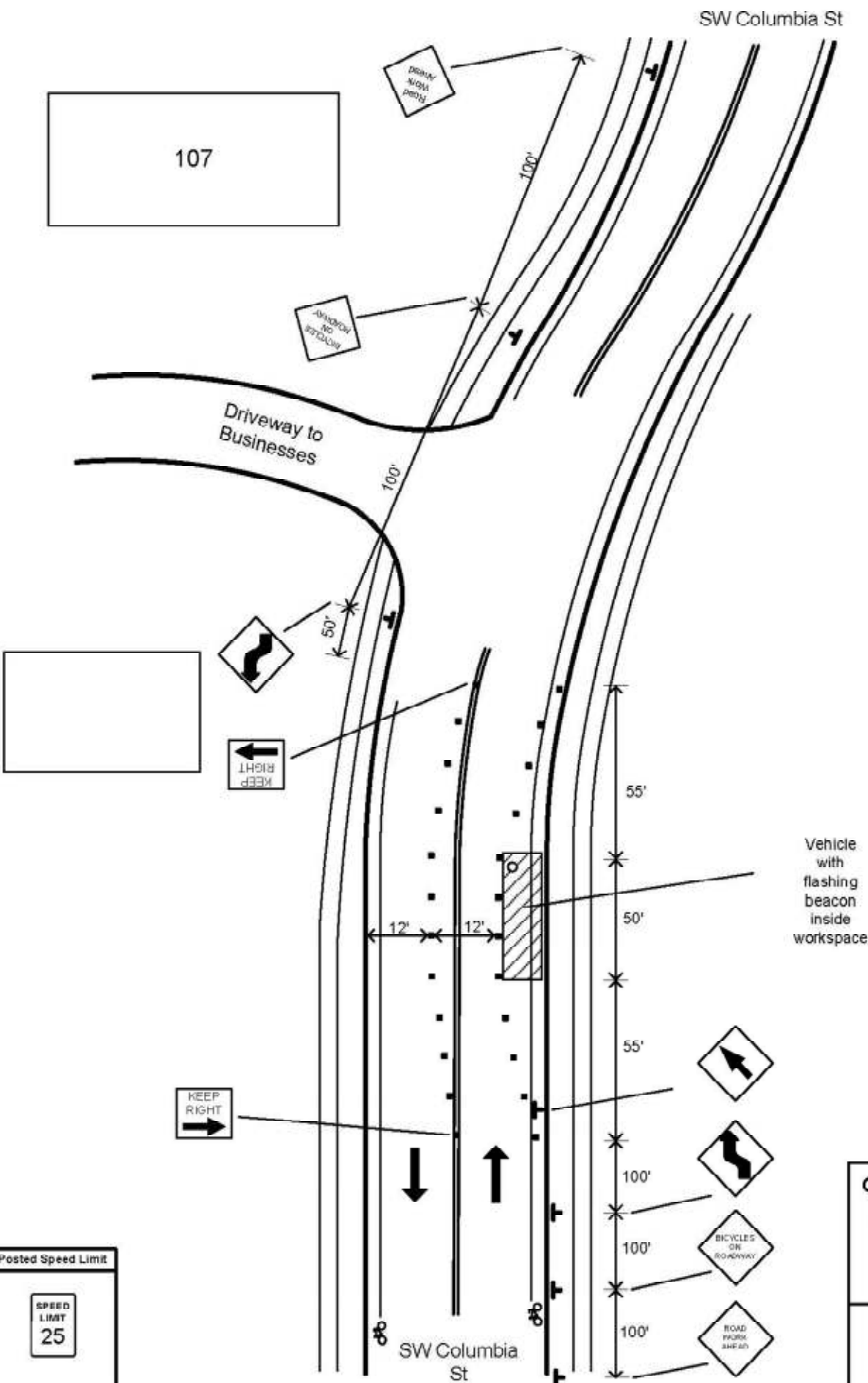
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/25/13





Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

**Site Access**  
2/15/13 - 4/15/13  
7:00am - 4:00pm



Bend\_008025

Site location

**ADS ENVIRONMENTAL  
SERVICES®**



Site access looking northwest



Bend\_008025

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



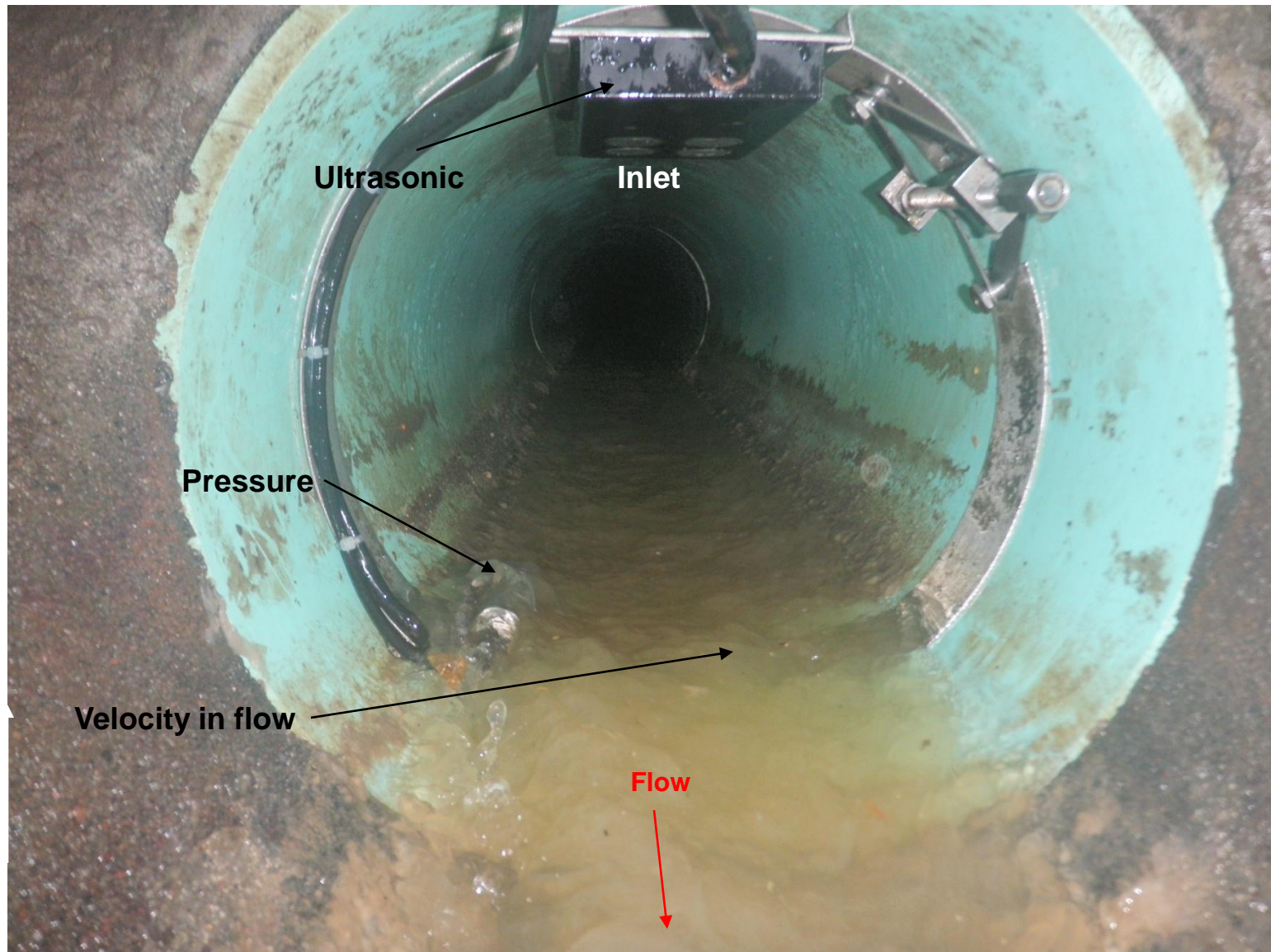
View down manhole facing north



Bend\_008025

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of sensor placement and site hydraulics



Bend\_008025

Site outlet

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_008025

## Flow Monitor

Bend\_008025

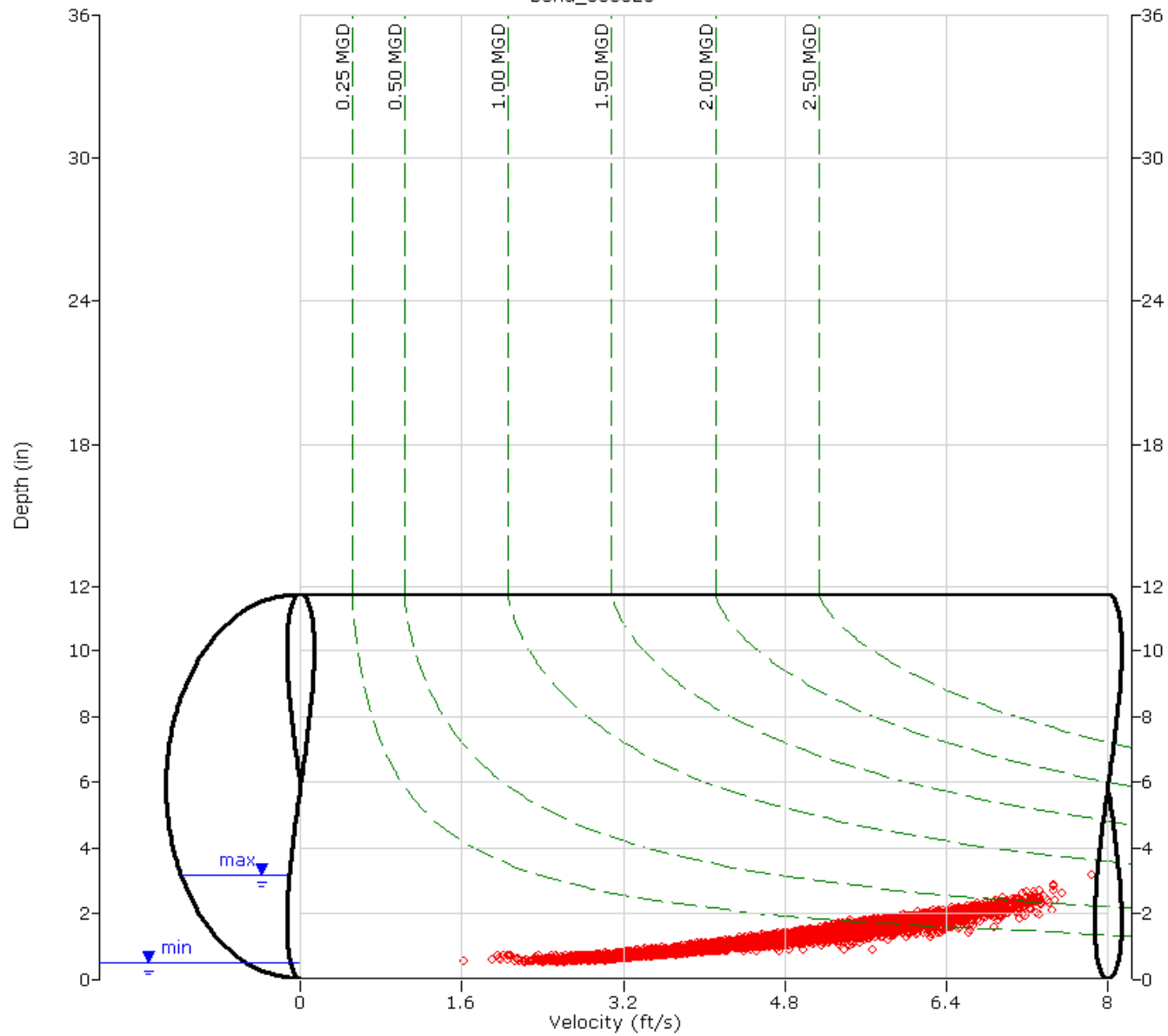
Pipe Height  
11.75 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_008025

## Flow Monitor

Bend\_008025

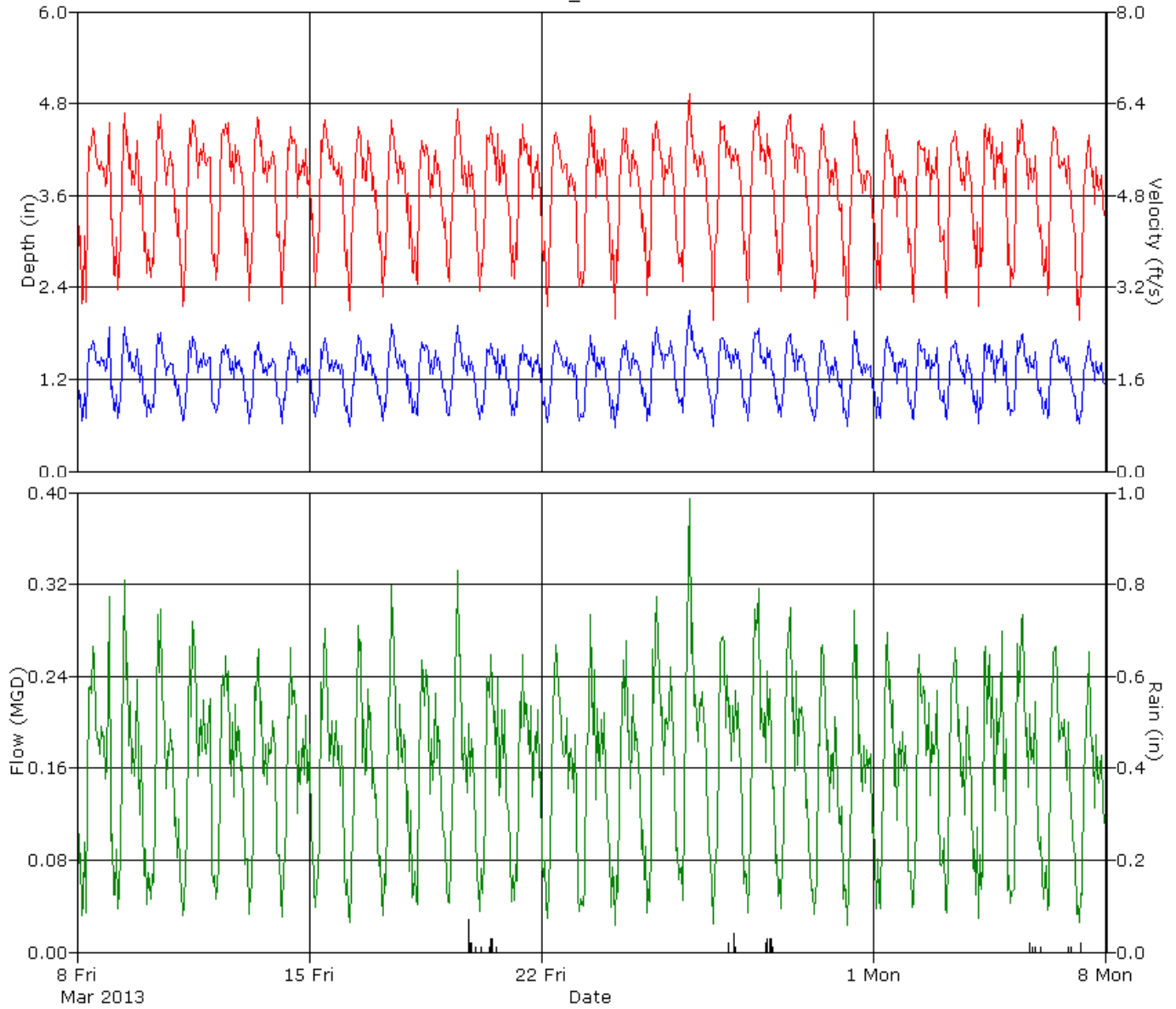
Pipe Height  
11.75 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





---

## Site Commentary

---

### Site Information

Bend_008030	
Measured Pipe Height (in)	18.13
Nominal Pipe Height (in)	18
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_008030 was located in the East of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a fairly repeatable data set with some hydraulic shifting noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 8%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.55	2.50	0.424
Minimum	1.80	0.95	0.063
Maximum	5.44	3.46	0.877
Time of Minimum	3/9/2013 5:15 AM	3/13/2013 4:10 AM	3/17/2013 6:40 AM
Time of Maximum	4/1/2013 11:25 AM	3/15/2013 1:00 PM	3/25/2013 2:35 PM

### Data Quality

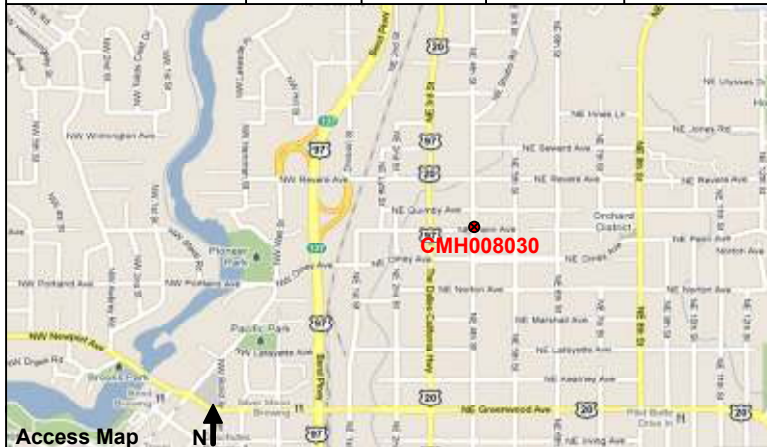
The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Invalid velocity data, most likely as a result of clear flow during the minimum flow period, was reconstituted in the data set.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_008030		Monitor Series: 5000 AG		Monitor S/N: 21804	
Address/Location: Intersection of NE 4 <sup>th</sup> St. and NE Penn Ave.		Manhole #		CMH008030	
		Coordinates:		44°03'57.14" N, 121°18'2.55" W	
		Pipe Height:		18.13"	
Access: Drive	Type of System:	Sanitary <input checked="" type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 18.00"
					IP Address: 166.219.172.36



Investigation Information:		Manhole Information:				
Date/Time of Investigation:	2/26/13 @ 14:07	Manhole Depth:	~ 8'			
Site Hydraulics:	Smooth with drawdown	Manhole Material / Condition	Concrete / Good			
Upstream Input: (L/S, P/S)	No influence	Pipe Material / Condition:	Concrete / Good			
Upstream Manhole:	90 degree bend in line	Mini System Character:	Residential <input type="checkbox"/>	Commercial <input type="checkbox"/>	Industrial <input type="checkbox"/>	Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	Turbulent	Telephone Information:	Doesn't apply			
Depth of Flow:	3.63" +/- .25"	Access Pole #:	Doesn't apply			
Range (Air DOF):	14.50" +/- .38"	Distance From Manhole:	Doesn't apply Feet			
Peak Velocity:	2.92 fps	Road Cut Length:	Doesn't apply Feet			
Silt:	0.00"	Trench Length:	Doesn't apply Feet			

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultrasonic, Velocity, Pressure	Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height:	None Observed	WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	Bend_RWRG	Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
---

5 psi pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_008030 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input checked="" type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only.  
Site is located in an intersection, follow all Traffic control plan procedures.

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/26/13

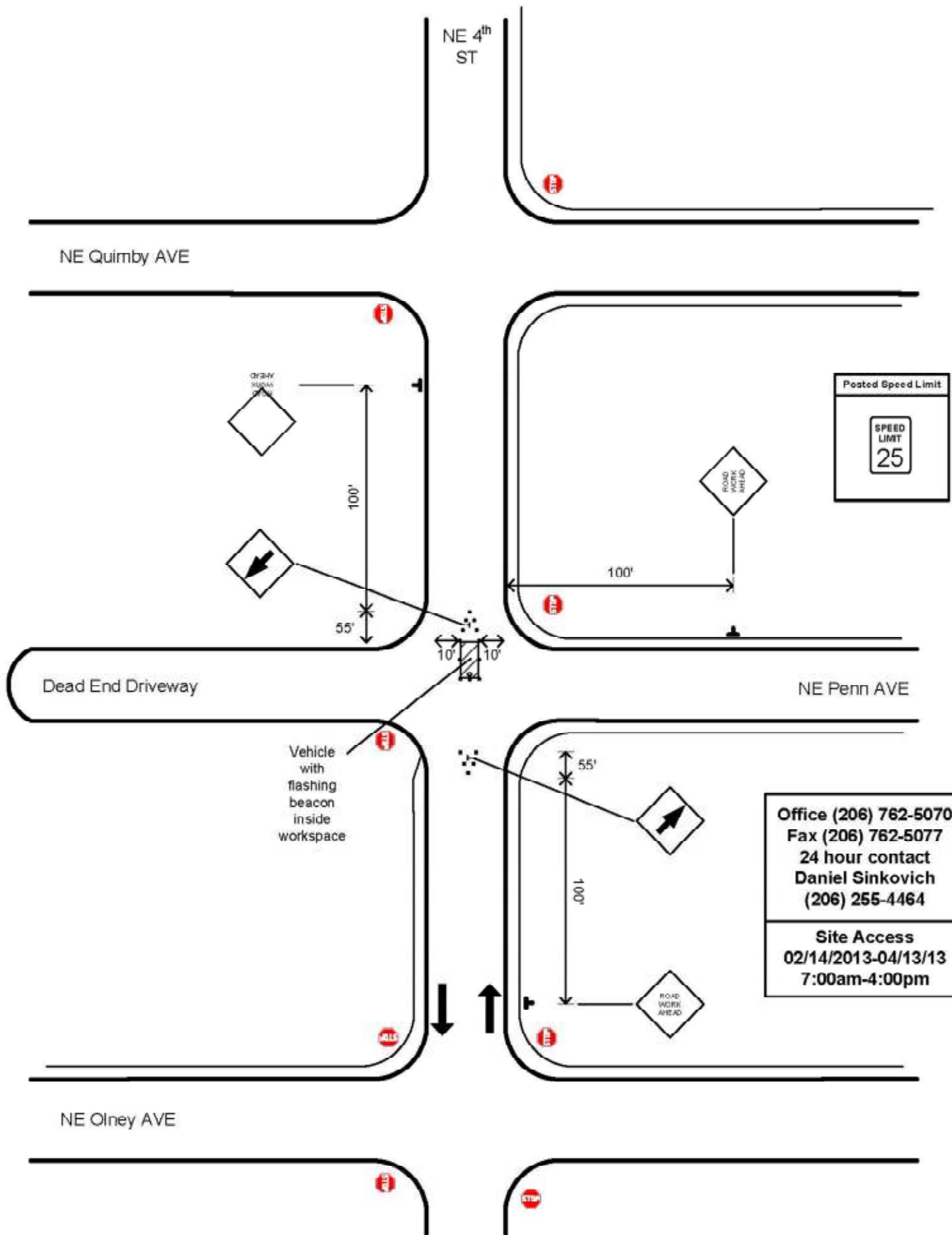
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/26/13







Bend\_008030

Site location

**ADS ENVIRONMENTAL  
SERVICES®**



Site access

Site access looking northeast



Bend\_008030

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View down manhole facing north



Bend\_008030

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of sensor placement and site hydraulics



Bend\_008030

Site outlet

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_008030

## Flow Monitor

Bend\_008030

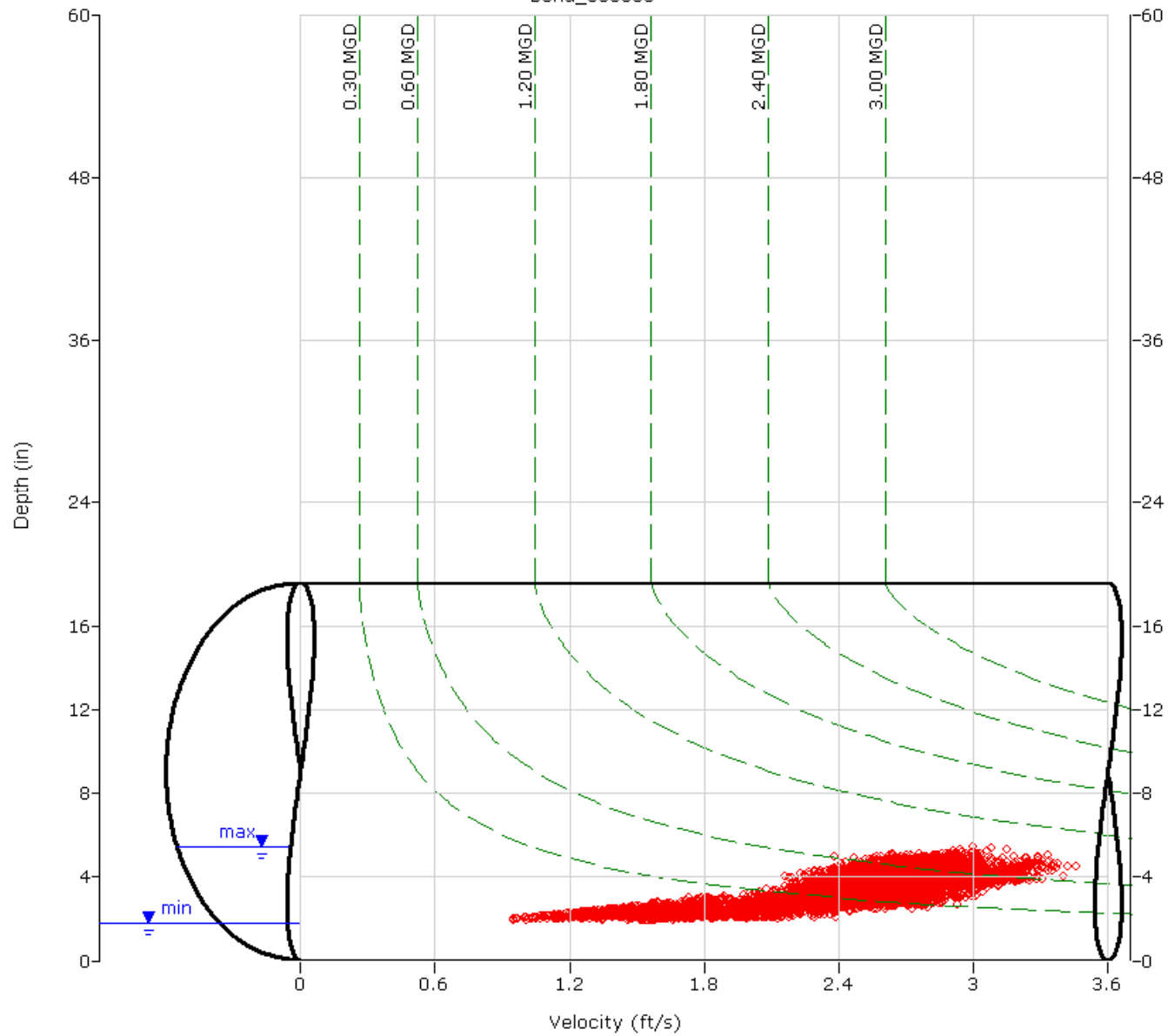
Pipe Height  
18.13 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_008030

## Flow Monitor

Bend\_008030

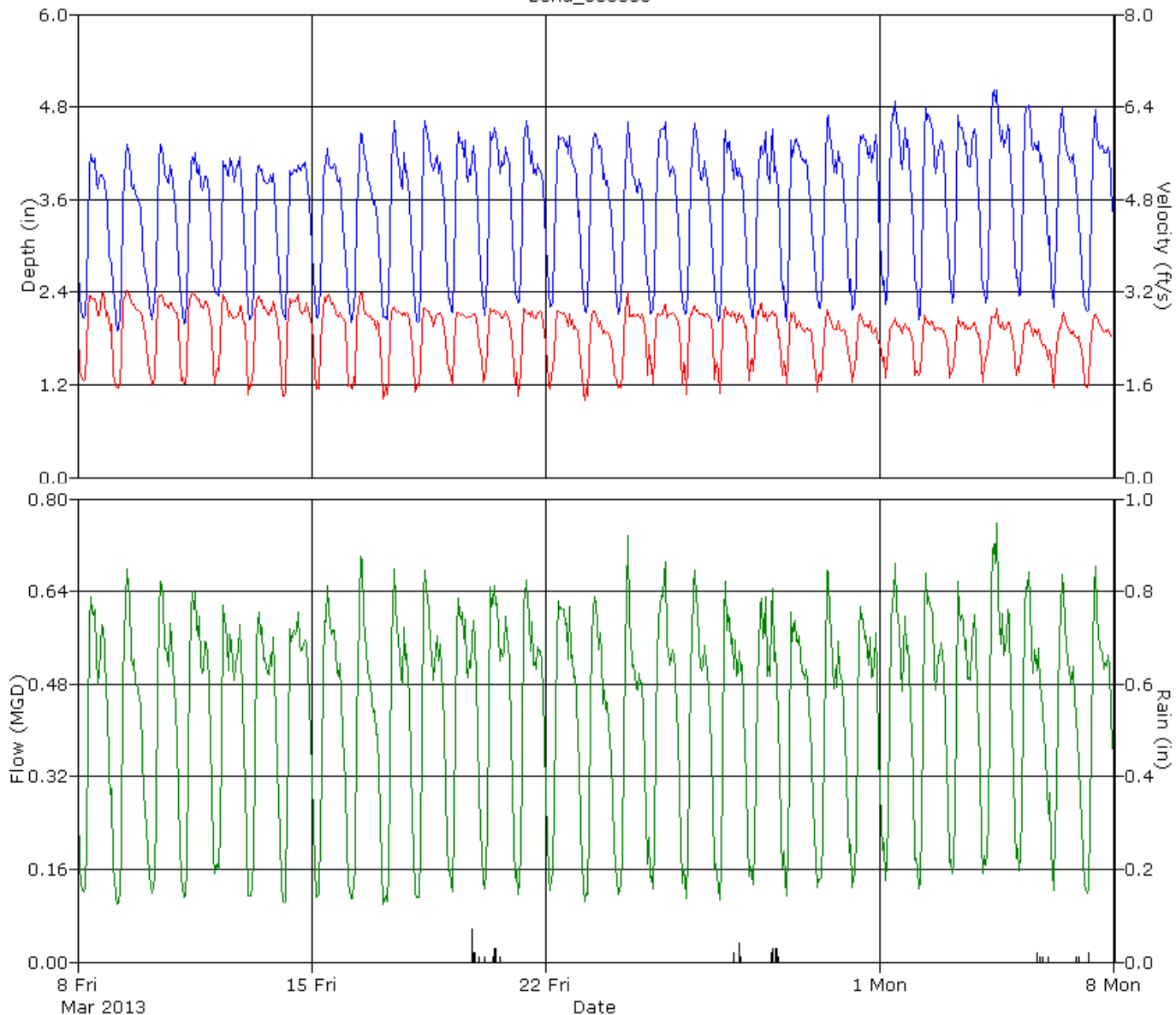
Pipe Height  
18.13 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_008141	
Measured Pipe Height (in)	27.13
Nominal Pipe Height (in)	27
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_008141 was located in the South of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with hydraulic stratification caused by undetermined hydraulic influences. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	6.96	2.54	1.413
Minimum	3.61	1.39	0.302
Maximum	10.03	3.61	3.132
Time of Minimum	3/29/2013 5:45 AM	3/16/2013 6:00 AM	3/21/2013 4:35 AM
Time of Maximum	3/9/2013 10:55 AM	3/9/2013 10:55 AM	3/9/2013 10:55 AM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_008141		Monitor Series: 5000 AG		Monitor S/N: 21005	
Address/Location: Intersection of NE 2 <sup>nd</sup> St. and NE Norton Ave.		Manhole #		CMH008141	
		Coordinates:		44°03'50.19" N 121°18'14.14" W	
		Pipe Height:		27.13"	
Access: Drive		Type of System:		Pipe Width: 27.00"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.172.38	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/21/13 @ 12:38	Manhole Depth:	~ 13'
Site Hydraulics:	Small standing wave	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No influence	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	7.25" +/- .25"	Access Pole #:	Doesn't apply
Range (Air DOF):	19.88" +/- .25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	2.76 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultrasonic, Velocity, Pressure	Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height:	None Observed	WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	Bend_RWRG	Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:	
15 psi pressure used at this location	



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_008141 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input checked="" type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/21/13

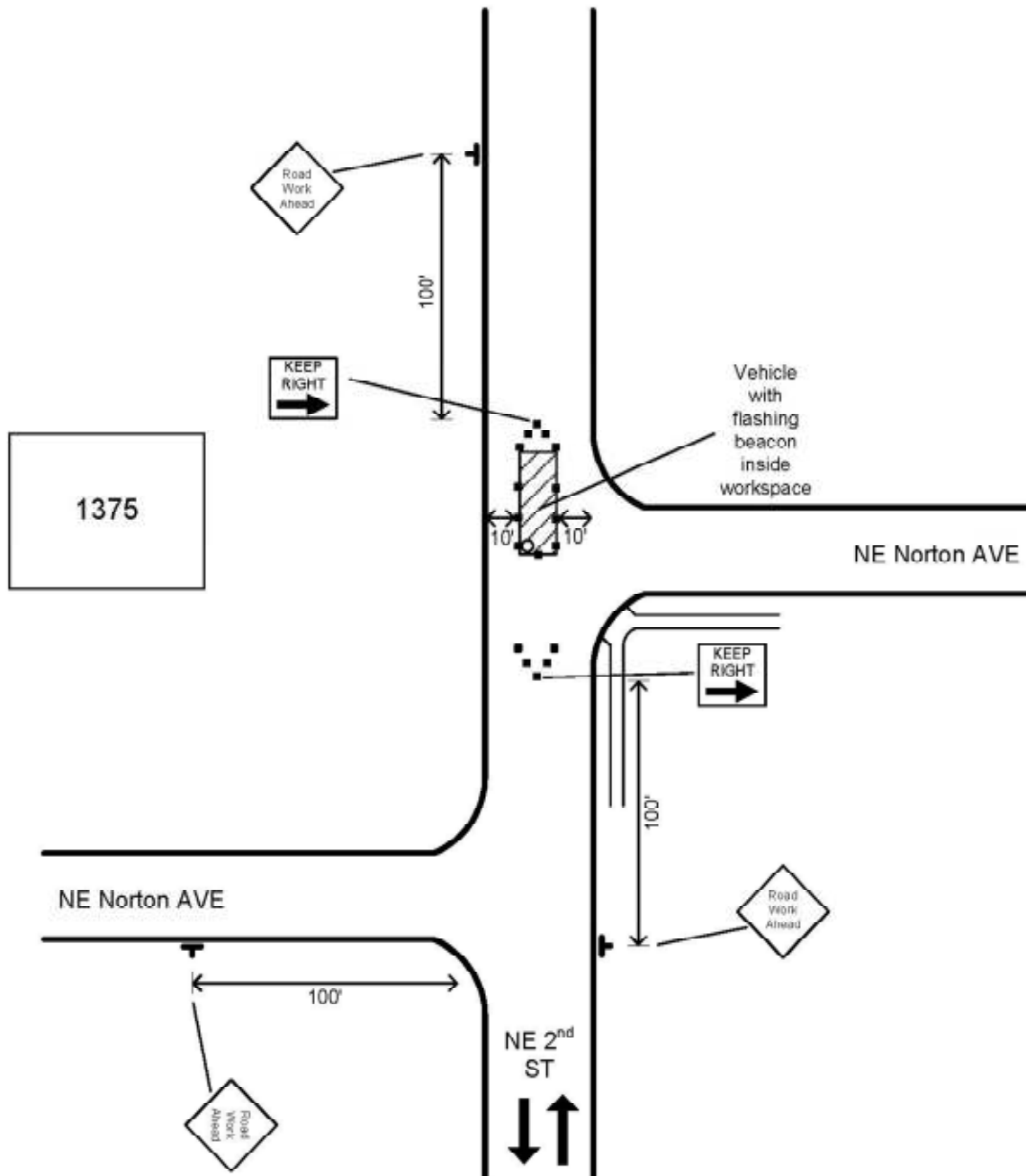
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/21/13





Posted Speed Limit

SPEED  
LIMIT  
25

Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

Site Access  
02/14/13-04/13/13  
7:00am-4:00pm



Bend\_008141  
Site Access

**ADS ENVIRONMENTAL  
SERVICES®**



Site access looking north



Bend\_008141

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



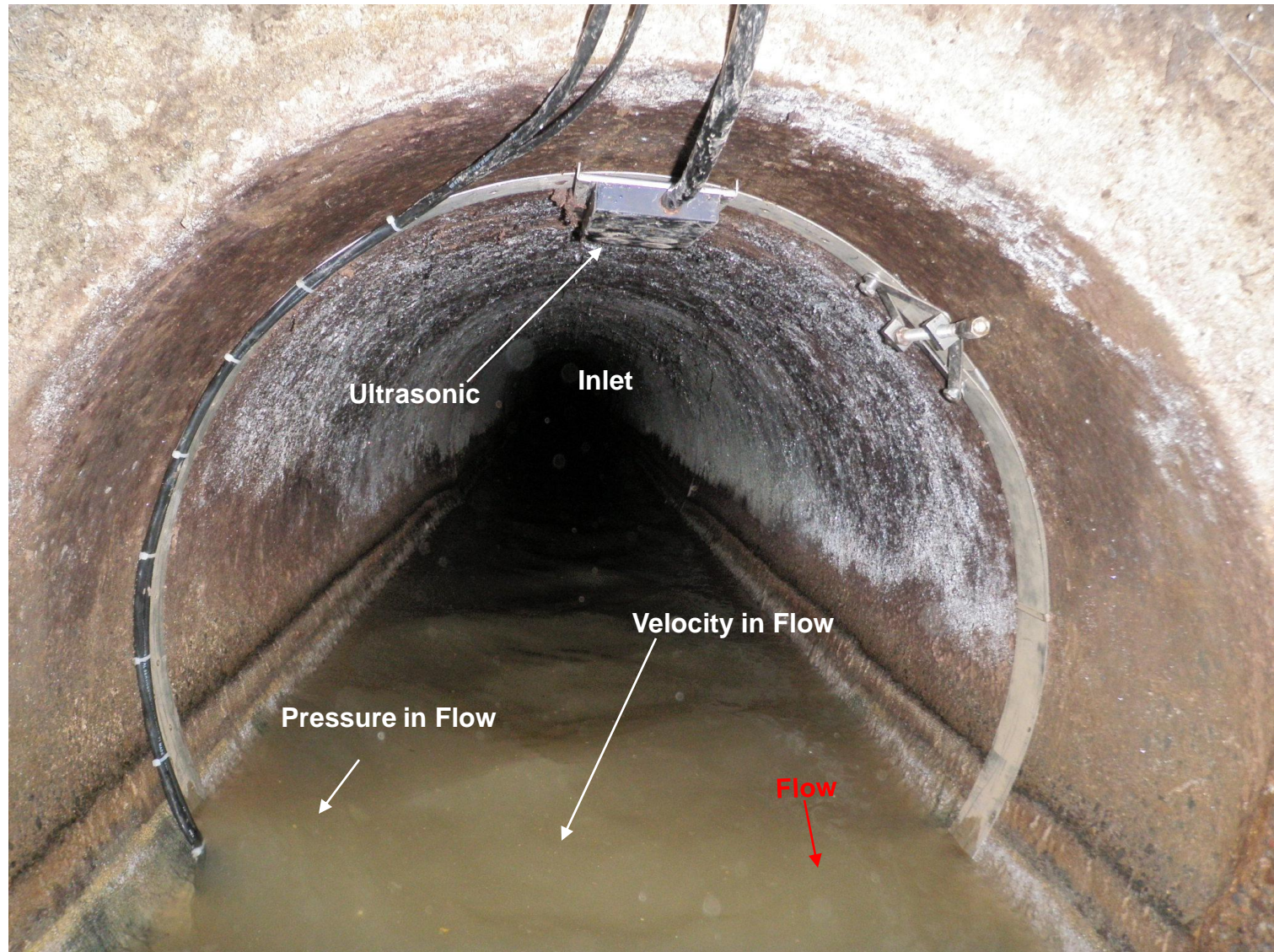
View of site looking north



Bend\_008141

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of inlet and sensors



Bend\_008141

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet



# SCATTERGRAPH REPORT

Bend\_008141

## Flow Monitor

Bend\_008141

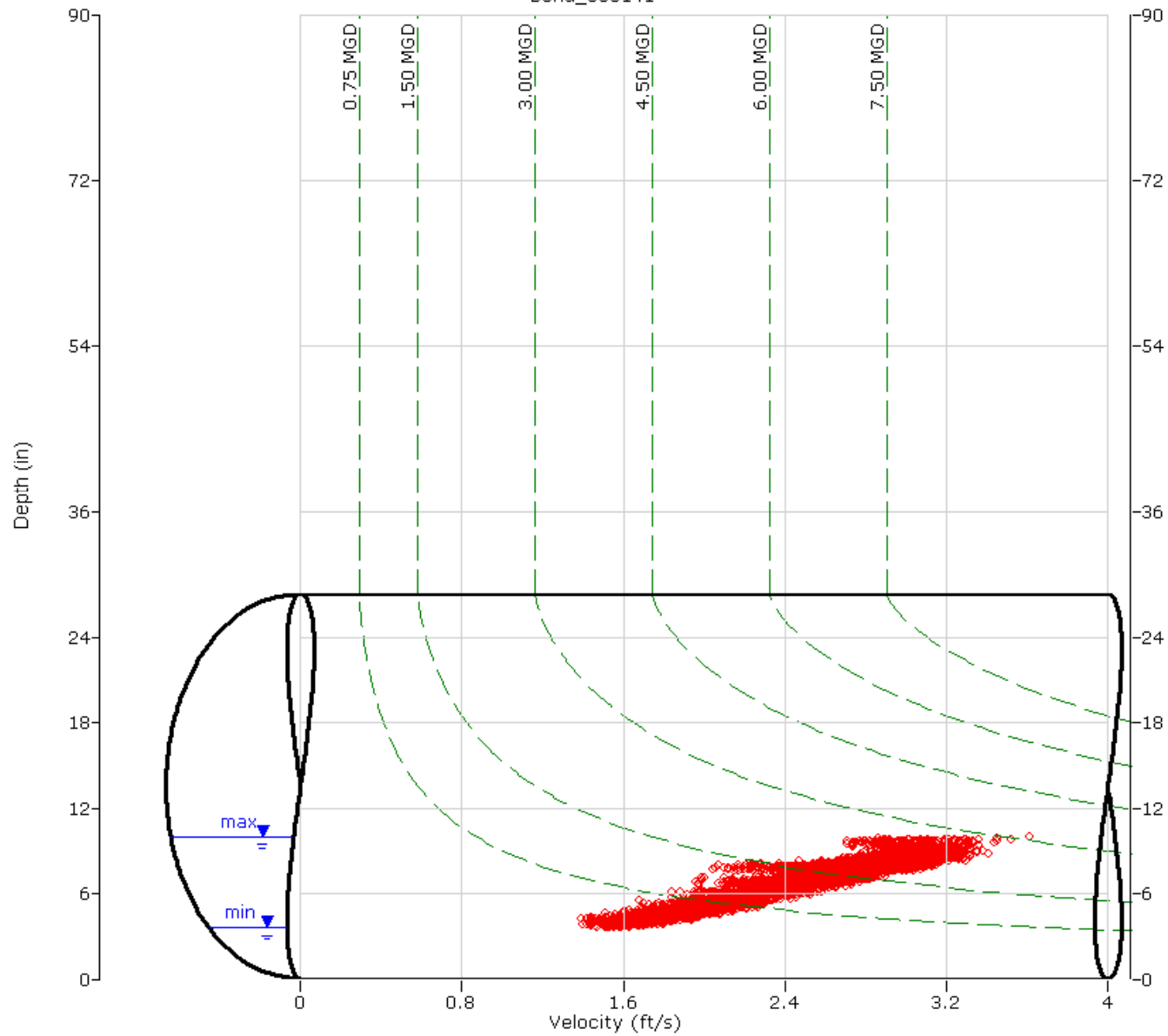
Pipe Height  
27.13 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_008141

## Flow Monitor

Bend\_008141

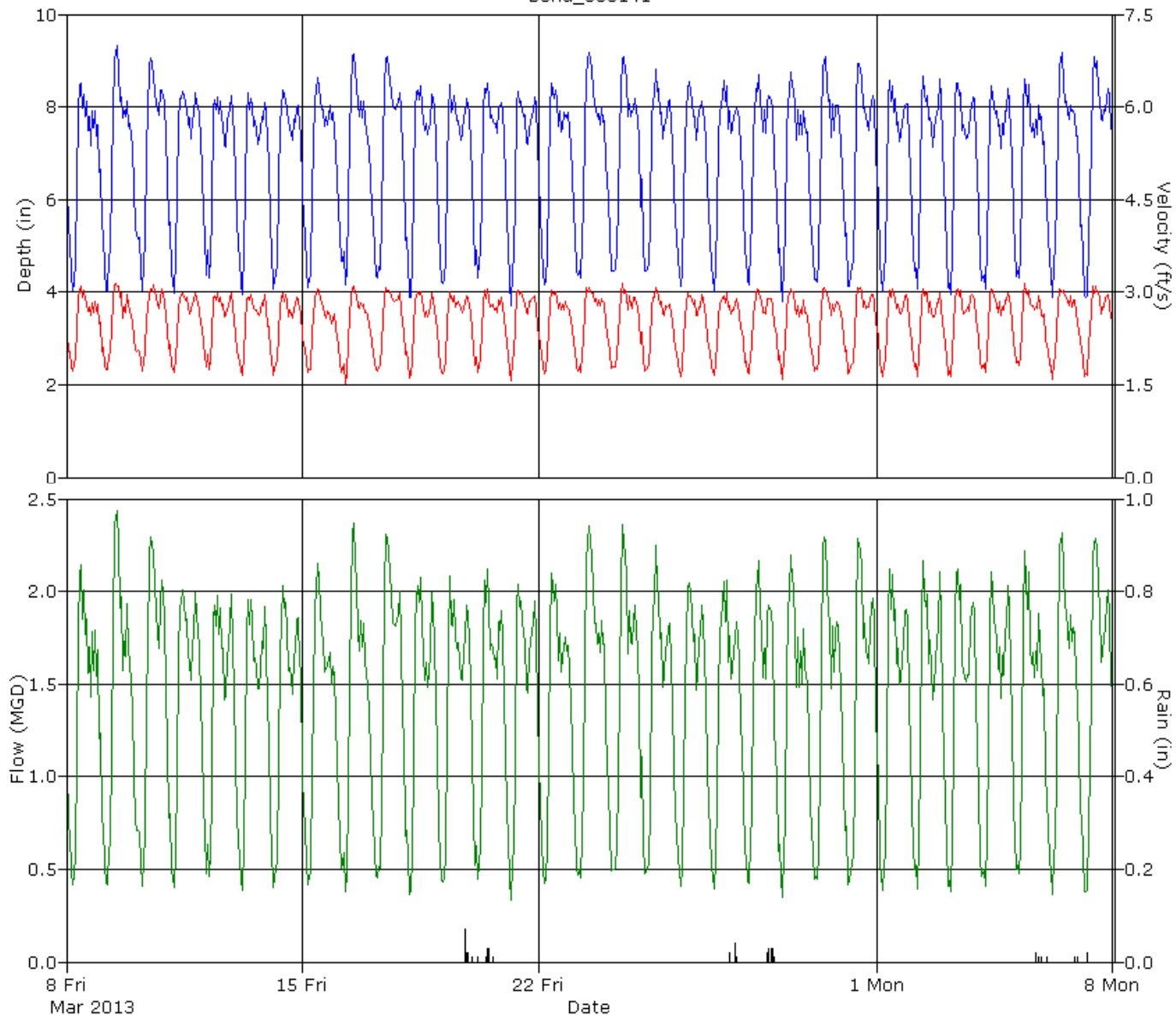
Pipe Height  
27.13 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

---

### Site Information

Bend_008182	
Measured Pipe Height (in)	10
Nominal Pipe Height (in)	10
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_008182 was located in the South of Bend (see attached site report for details). Originally this site was to be monitored at CMH008170, but that location had a hydraulic jump. The data for this location begins on March 11, 2013.

The hydrograph indicates a residential diurnal flow pattern with lift station influence during the period Monday, March 11, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Monday, March 11, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.76	1.22	0.116
Minimum	1.23	0.25	0.006
Maximum	4.98	3.28	0.493
Time of Minimum	4/5/2013 3:50 AM	3/27/2013 4:35 AM	4/5/2013 3:50 AM
Time of Maximum	3/28/2013 10:40 AM	3/28/2013 6:25 PM	4/2/2013 12:35 PM

### Data Quality

The data uptime for the Monday, March 11, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Originally this site was to be monitored at CMH008170, but that location had a hydraulic jump. The data for this location begins on March 11, 2013. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	89
Velocity	89
Quantity	89



Bend\_008182

Site location

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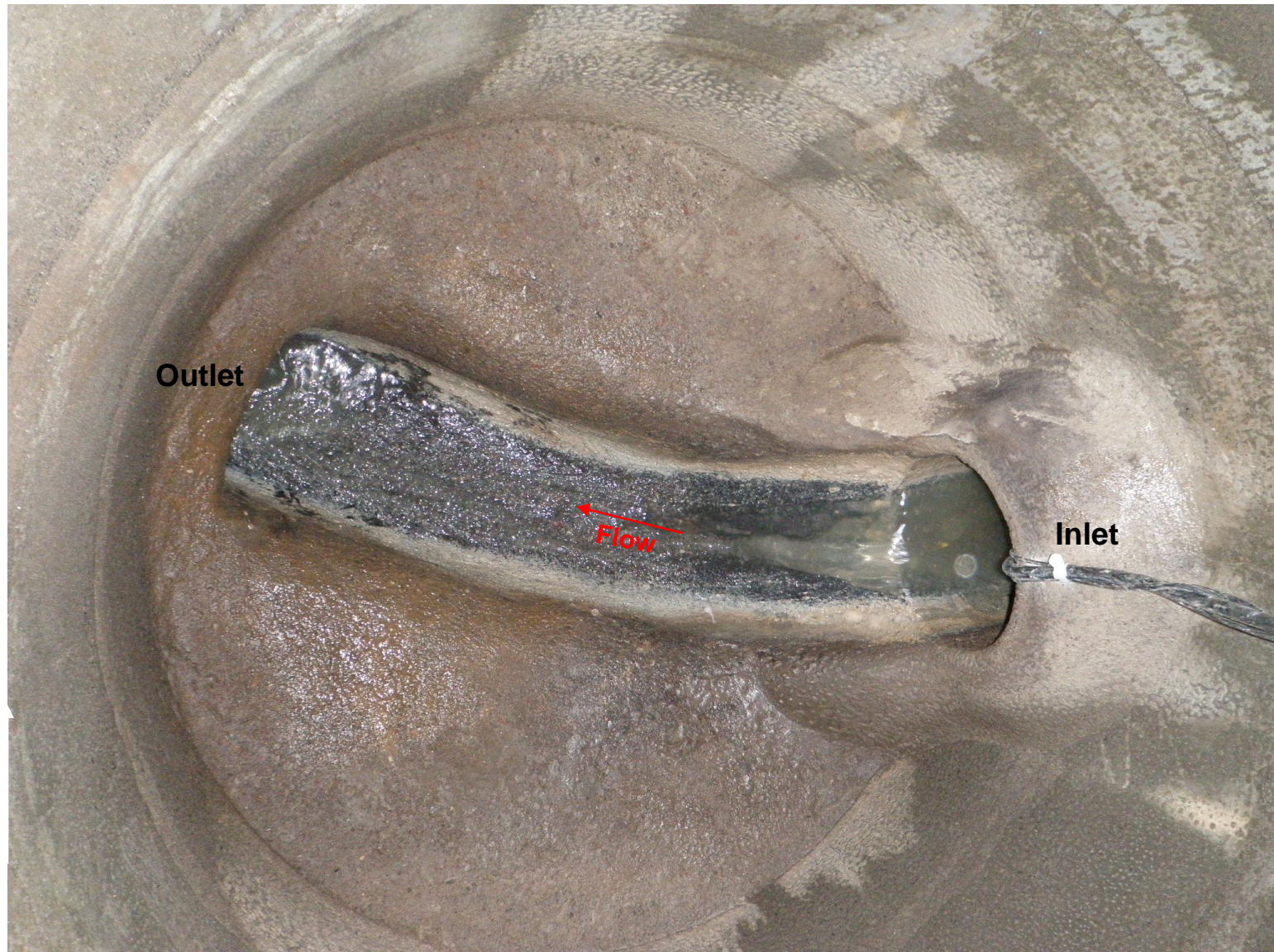
Site access looking northwest



Bend\_008182

Site set up

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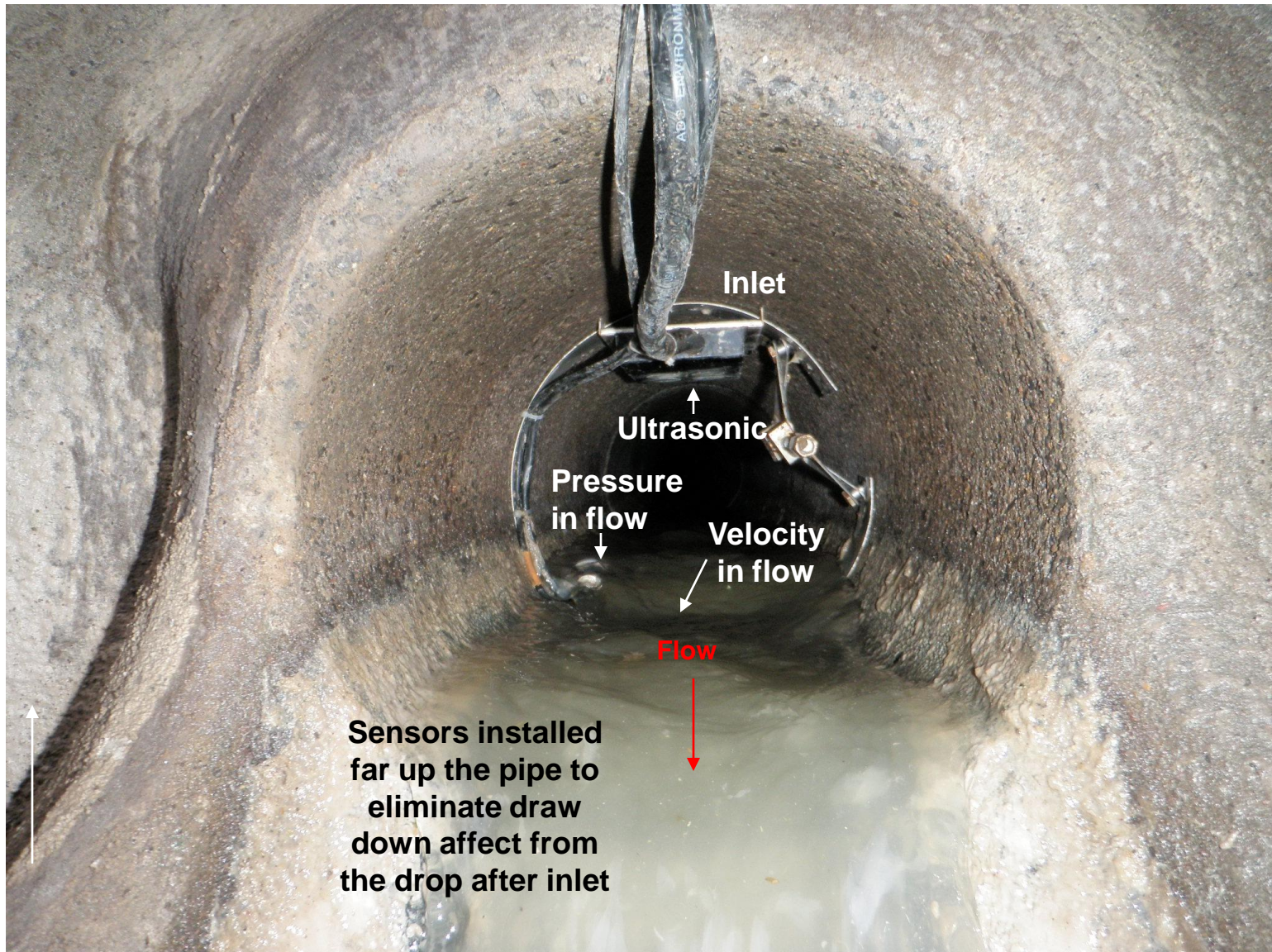
View down manhole facing north



Bend\_008182

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of sensor placement and site hydraulics



Bend\_008182

Site outlet



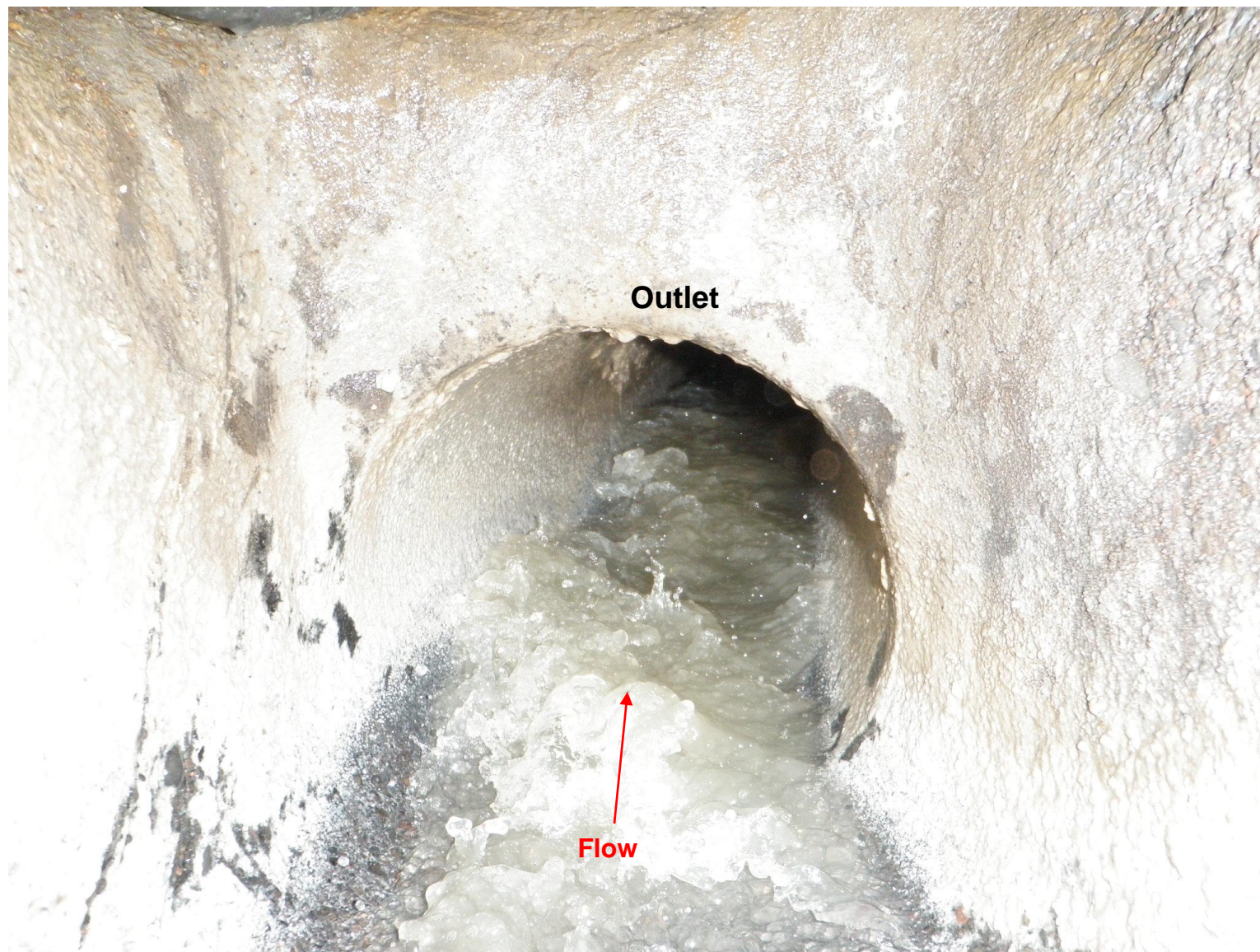
View of inlet and hydraulics



Bend\_008182

Site outlet

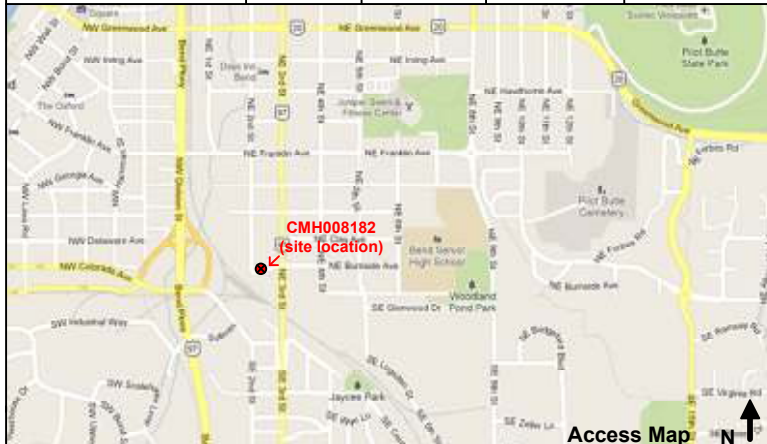
**ADS ENVIRONMENTAL  
SERVICES®**



View of outlet and hydraulics



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_008182		Monitor Series: 5000 AG		Monitor S/N: 21475	
Address/Location: 201 NE Burnside Ave		Manhole #		CMH008182	
		Coordinates:		44°03'07.49"N 121°18'12.78"W	
		Pipe Height:		10.00"	
Access: Drive		Type of System:		Sanitary <input checked="" type="checkbox"/> Storm <input type="checkbox"/> Combined <input type="checkbox"/>	
		Pipe Width:		10.00"	
		IP Address:		166.219.172.61	

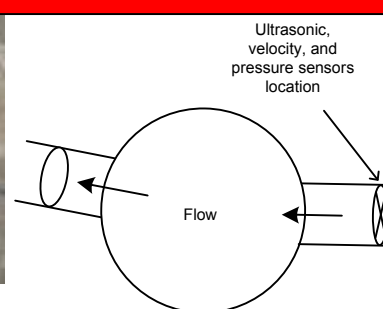
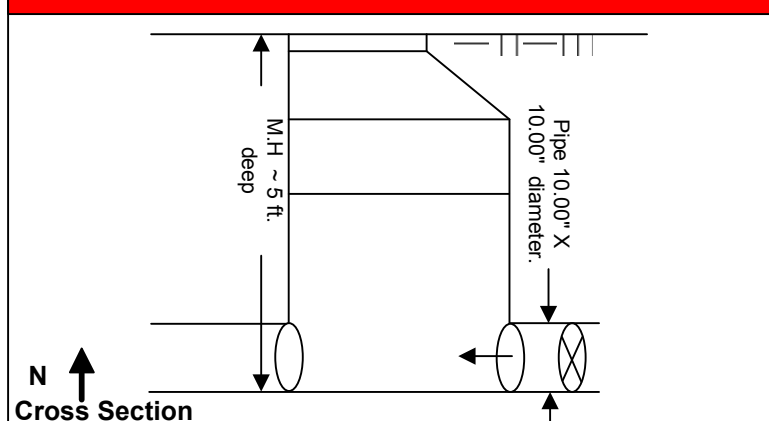


### Investigation Information:

### Manhole Information:

Date/Time of Investigation:	3/11/2013 @ 11:50	Manhole Depth:	~ 5'			
Site Hydraulics:	Ripples	Manhole Material / Condition	Concrete / Good			
Upstream Input: (L/S, P/S)	No influence	Pipe Material / Condition:	Concrete / Good			
Upstream Manhole:	Close to surcharge condition	Mini System Character:	Residential <input checked="" type="checkbox"/>	Commercial <input checked="" type="checkbox"/>	Industrial <input type="checkbox"/>	Trunk <input type="checkbox"/>
Downstream Manhole:	90° bend	Telephone Information:	Doesn't apply			
Depth of Flow:	2.5" +/- 0.25"	Access Pole #:	Doesn't apply			
Range (Air DOF):	7.5" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet			
Peak Velocity:	1.40 fps	Road Cut Length:	Doesn't apply Feet			
Silt:	0.00"	Trench Length:	Doesn't apply Feet			

### Other Information:



Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

### Additional Site Information / Comments:

5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_008182 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only.

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☒ Standard Traffic Control Plan TA-15 is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Dan Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 3/11/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 3/11/13



# SCATTERGRAPH REPORT

Bend\_008182

## Flow Monitor

Bend\_008182

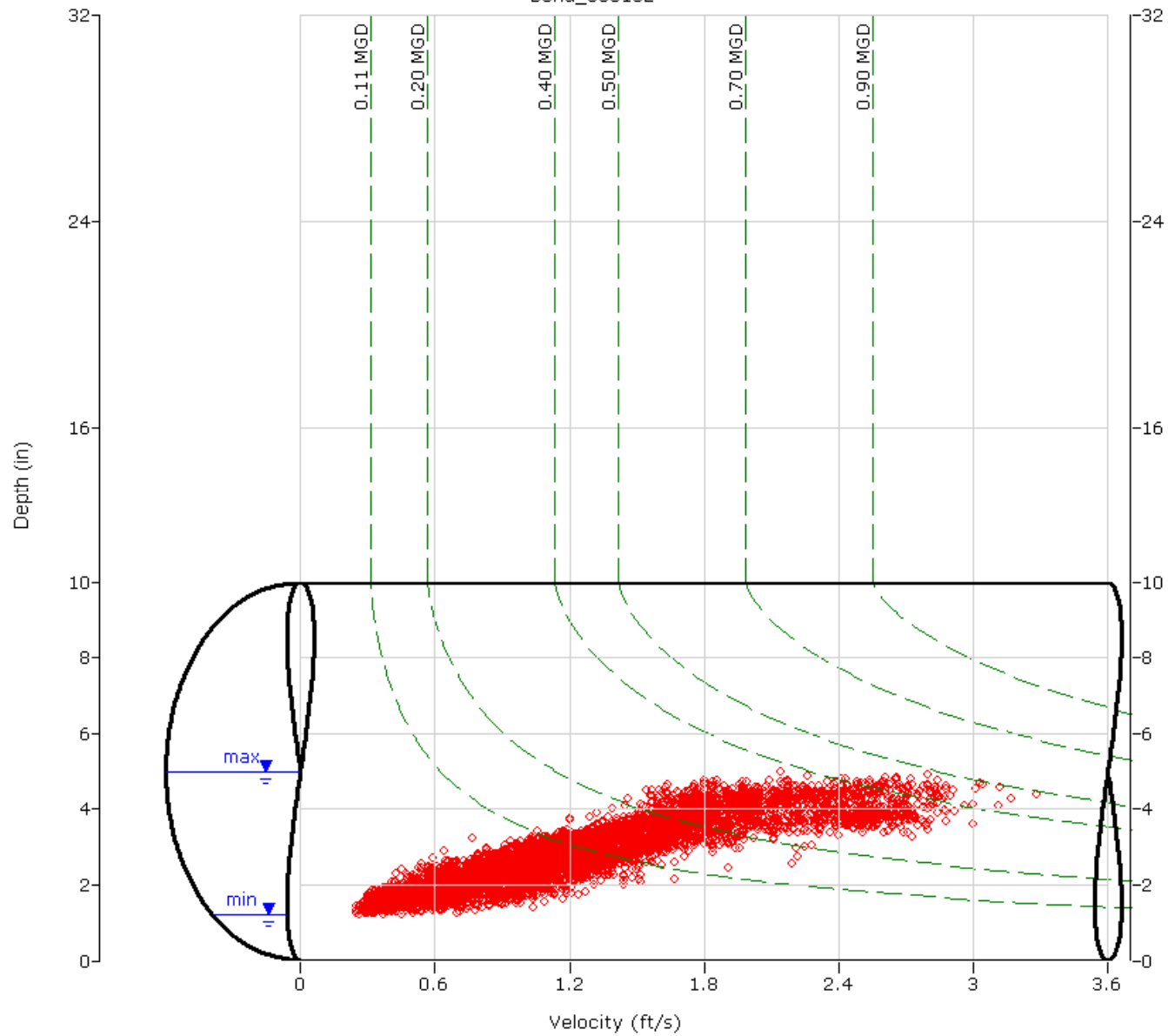
Pipe Height  
10.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_008182

## Flow Monitor

Bend\_008182

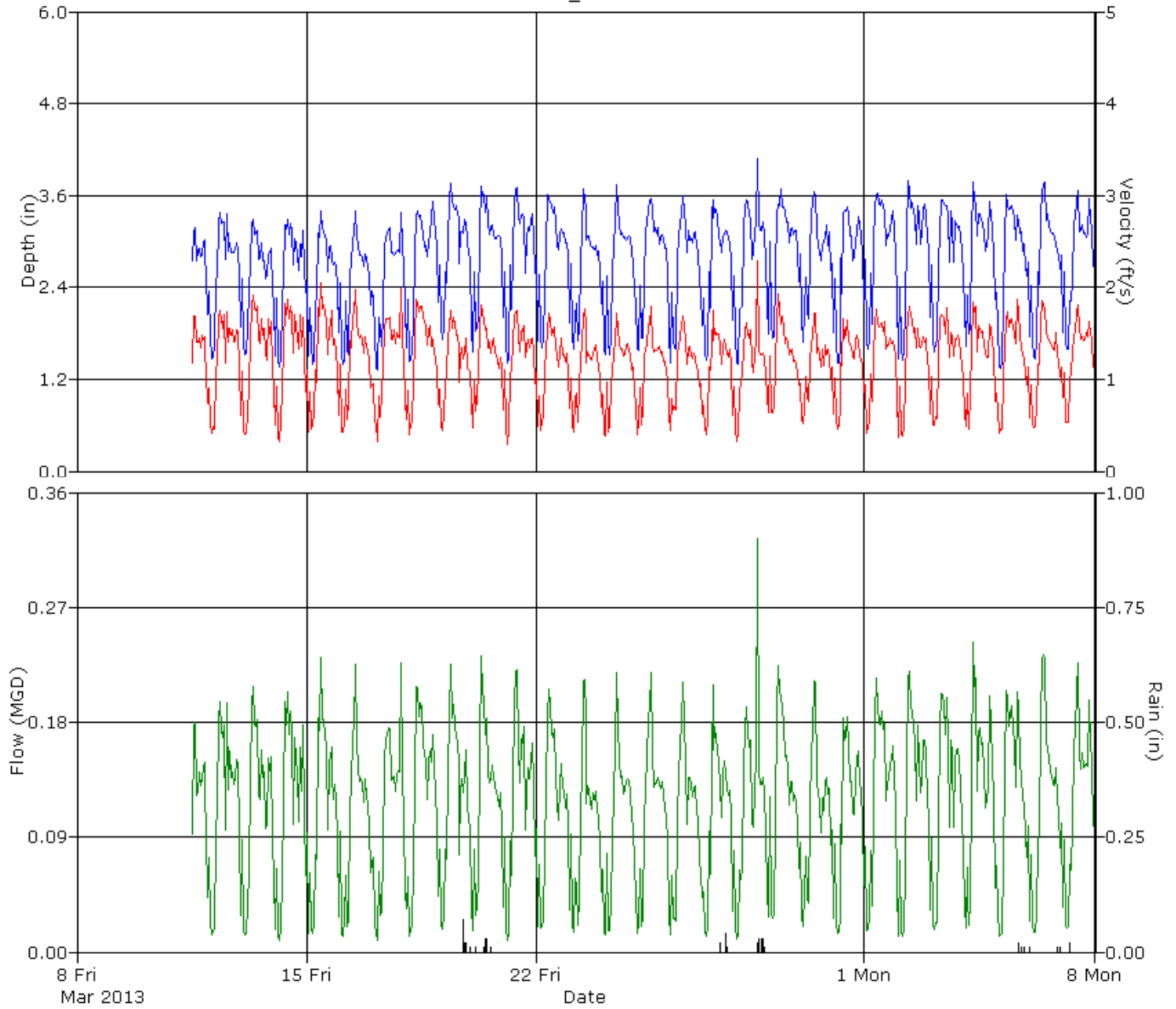
Pipe Height  
10.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_008521	
Measured Pipe Height (in)	14.5
Nominal Pipe Height (in)	15
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_008521 was located in the Center of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern with lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with hydraulic stratification caused by undetermined hydraulic influences. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.57	1.77	0.269
Minimum	1.74	0.64	0.034
Maximum	5.10	2.50	0.552
Time of Minimum	3/30/2013 4:25 AM	4/2/2013 4:10 AM	3/30/2013 4:30 AM
Time of Maximum	3/8/2013 9:55 PM	3/8/2013 6:40 PM	3/8/2013 9:55 PM

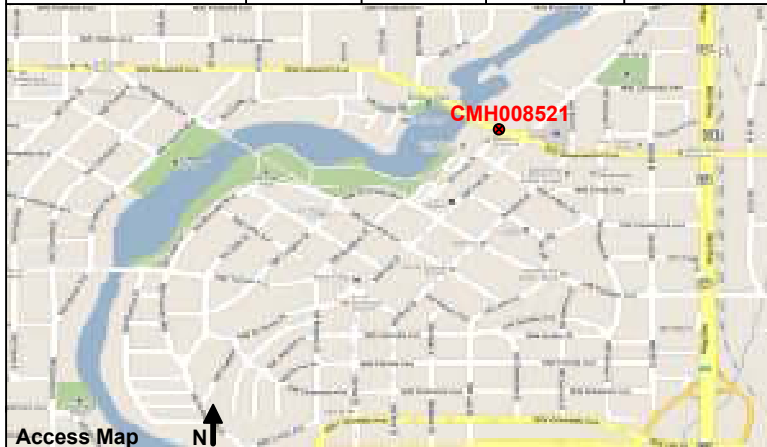
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	99
Quantity	99

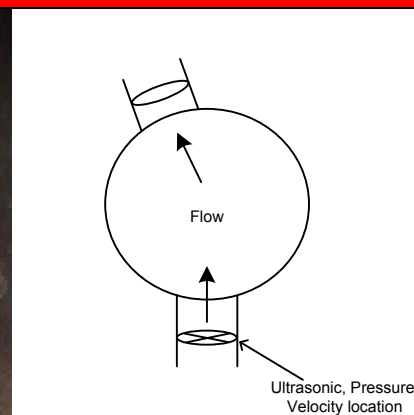
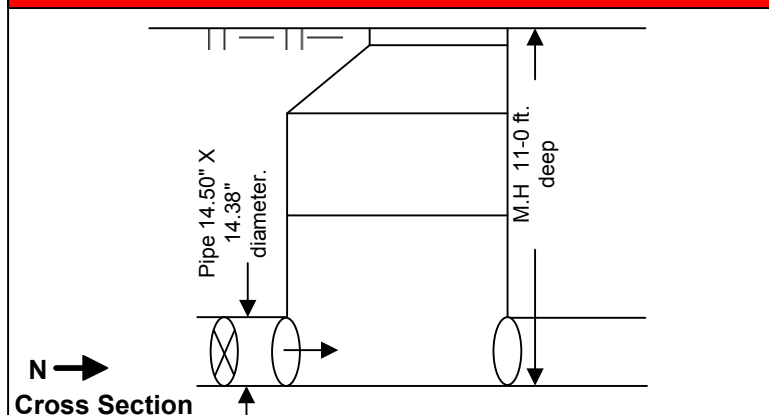


Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_008521		Monitor Series: 5000 AG		Monitor S/N: 21243	
Address/Location: 1019 NW Brooks St (Bend Brewing Company)		Manhole #		CMH008521	
		Coordinates:		44° 3'37.91"N 121°18'47.97"W	
		Pipe Height:		14.50"	
Access: Drive		Type of System:		Pipe Width: 14.38"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.172.48	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/21/13 @ 7:35	Manhole Depth:	~ 11'
Site Hydraulics:	Small waves steady flow	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No influence	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	3.75" +/- .25"	Access Pole #:	Doesn't apply
Range (Air DOF):	10.75" +/- .25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.90 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

### Other Information:



Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices:	Ultrasonic, Velocity, Pressure	Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height:	None Observed	WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone:	Bend_RWRG	Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

### Additional Site Information / Comments:

5 psi pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_008521 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input checked="" type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/21/13

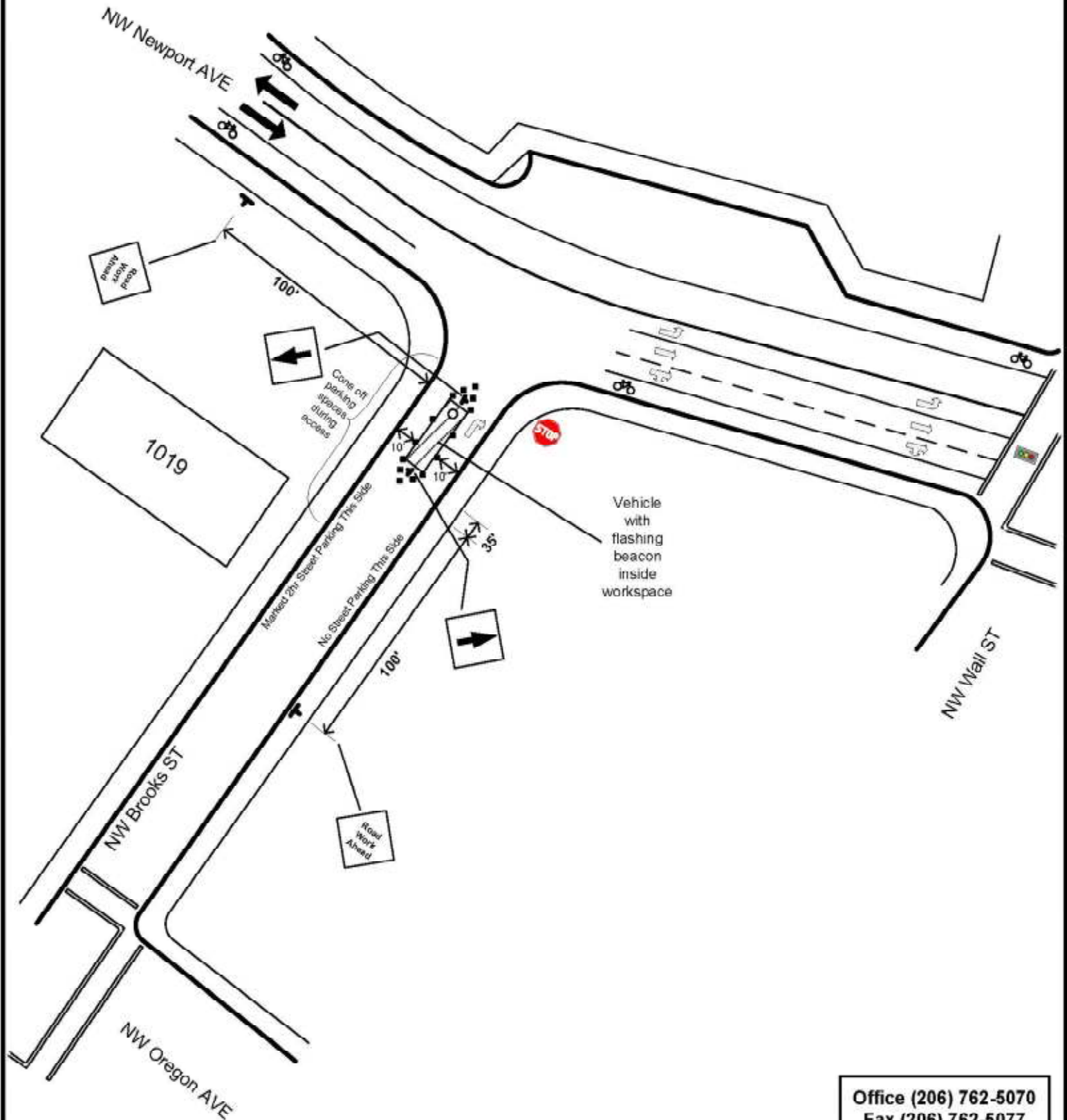
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/21/13





Posted Speed Limit	
NW Newport AVE	NW Brooks ST
SPEED LIMIT 25	SPEED LIMIT 20

Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

Site Access  
02/14/13-04/13/13  
7:00am-4:00pm



Bend\_008521

Site location

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SERVICES®**



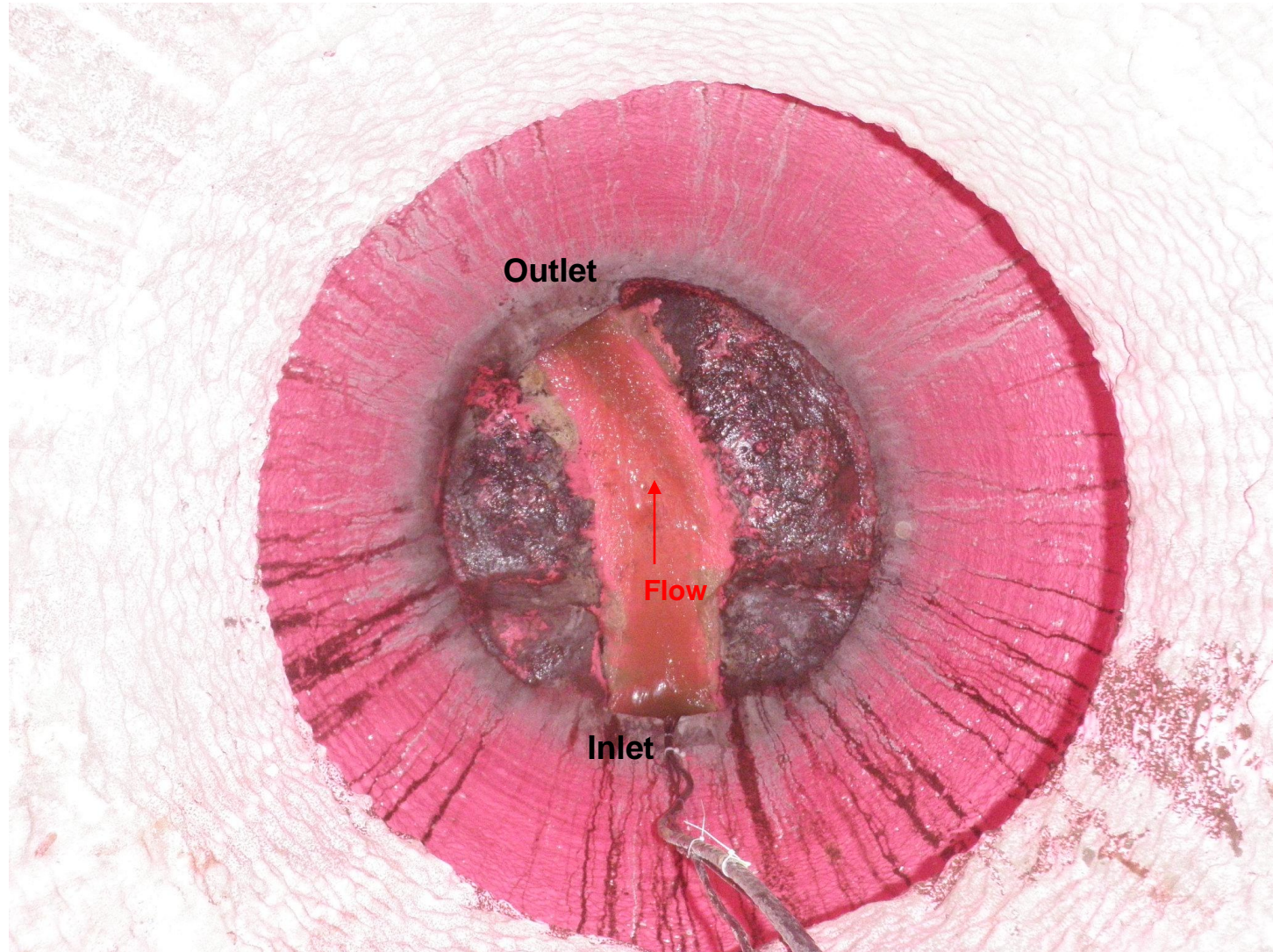
Site access looking southwest



Bend\_008521

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View down manhole facing north



Bend\_008521

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



**View of sensor placement and site hydraulics**



Bend\_008521

Site outlet

**ADS ENVIRONMENTAL  
SERVICES®**



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_008521

## Flow Monitor

Bend\_008521

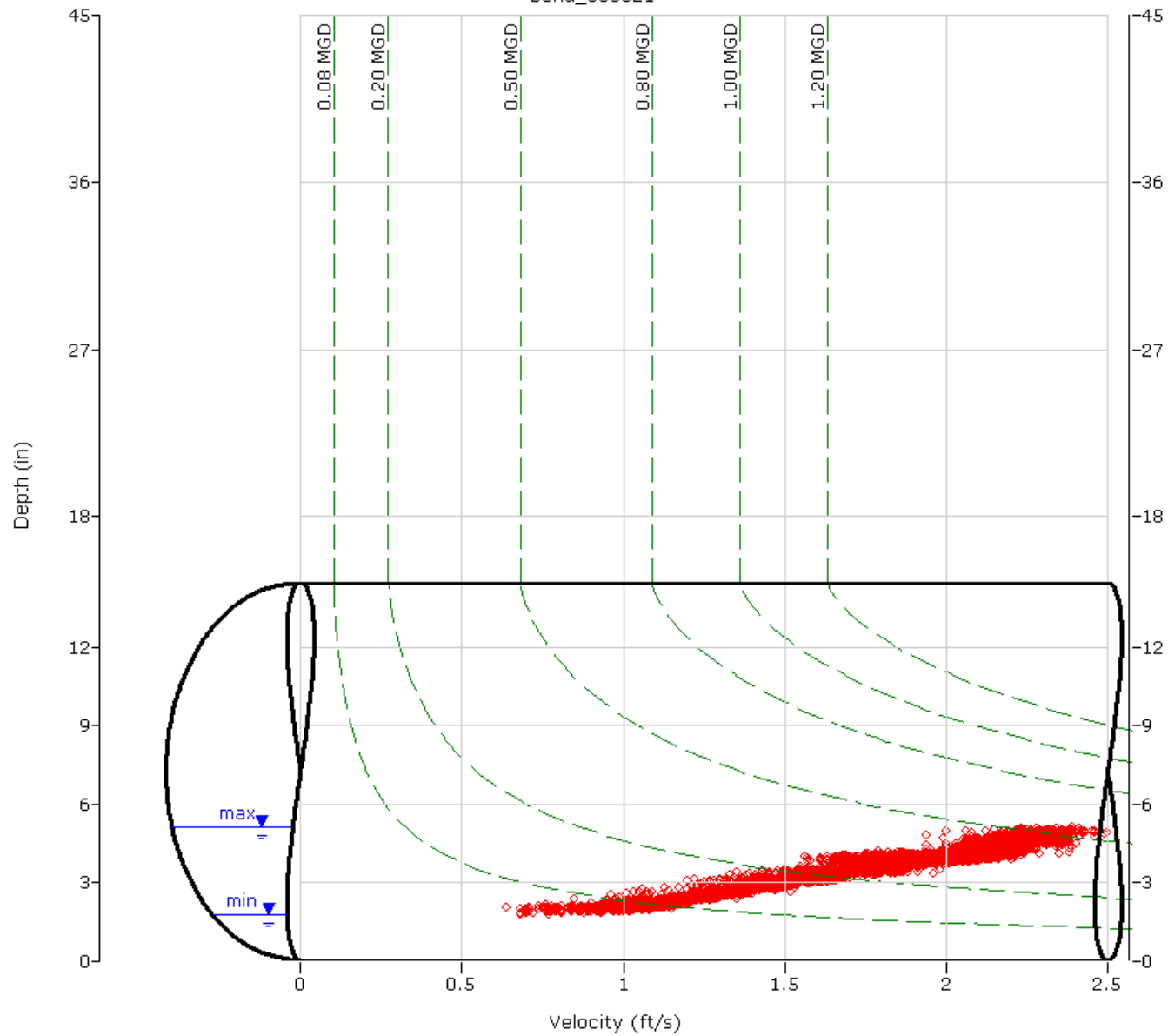
Pipe Height  
14.50 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_008521

## Flow Monitor

Bend\_008521

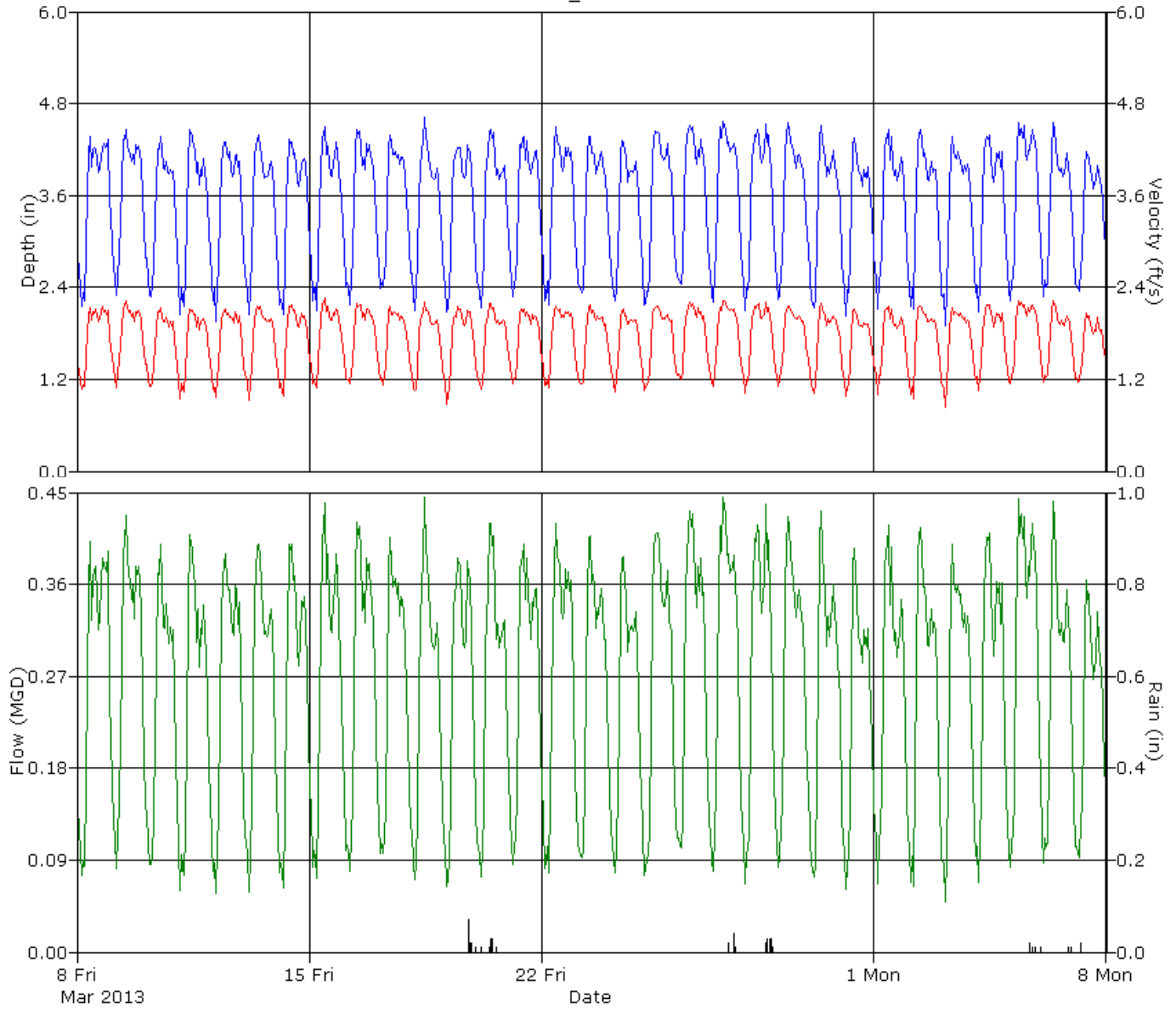
Pipe Height  
14.50 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_008568	
Measured Pipe Height (in)	21
Nominal Pipe Height (in)	21
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_008568 was located in the West of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern with lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	5.87	1.54	0.577
Minimum	2.88	0.80	0.105
Maximum	9.20	2.06	1.313
Time of Minimum	3/8/2013 4:05 AM	3/22/2013 4:45 AM	3/8/2013 4:25 AM
Time of Maximum	4/5/2013 9:10 AM	3/31/2013 11:00 AM	3/31/2013 11:15 AM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100

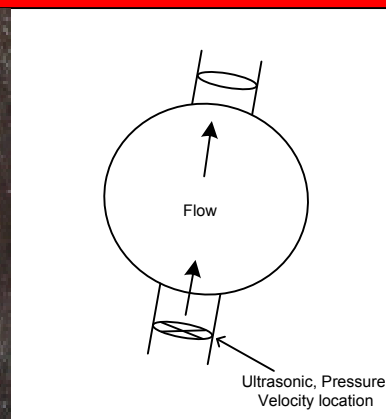
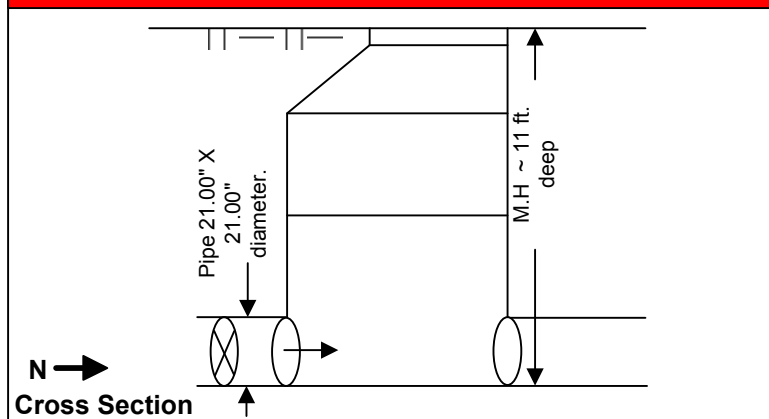


Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_008568		Monitor Series: 5000 AG		Monitor S/N: 21169	
Address/Location: 1452 NW Harmon Blvd		Manhole #: CMH008568		Coordinates: 44° 3'41.98"N 121°19'18.08"W	
		Pipe Height: 21.00"		Pipe Width: 21.00"	
Access: Drive		Type of System: Sanitary <input checked="" type="checkbox"/> Storm <input type="checkbox"/> Combined <input type="checkbox"/>		IP Address: 166.219.172.66	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/21/13 @ 10:38	Manhole Depth:	~ 11'
Site Hydraulics:	Smooth, steady flow	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No influence	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	7.38" +/- .25"	Access Pole #:	Doesn't apply
Range (Air DOF):	13.62" +/- .25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.90 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

### Other Information:



Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None Observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

### Additional Site Information / Comments:

5 psi pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_008568 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/21/13

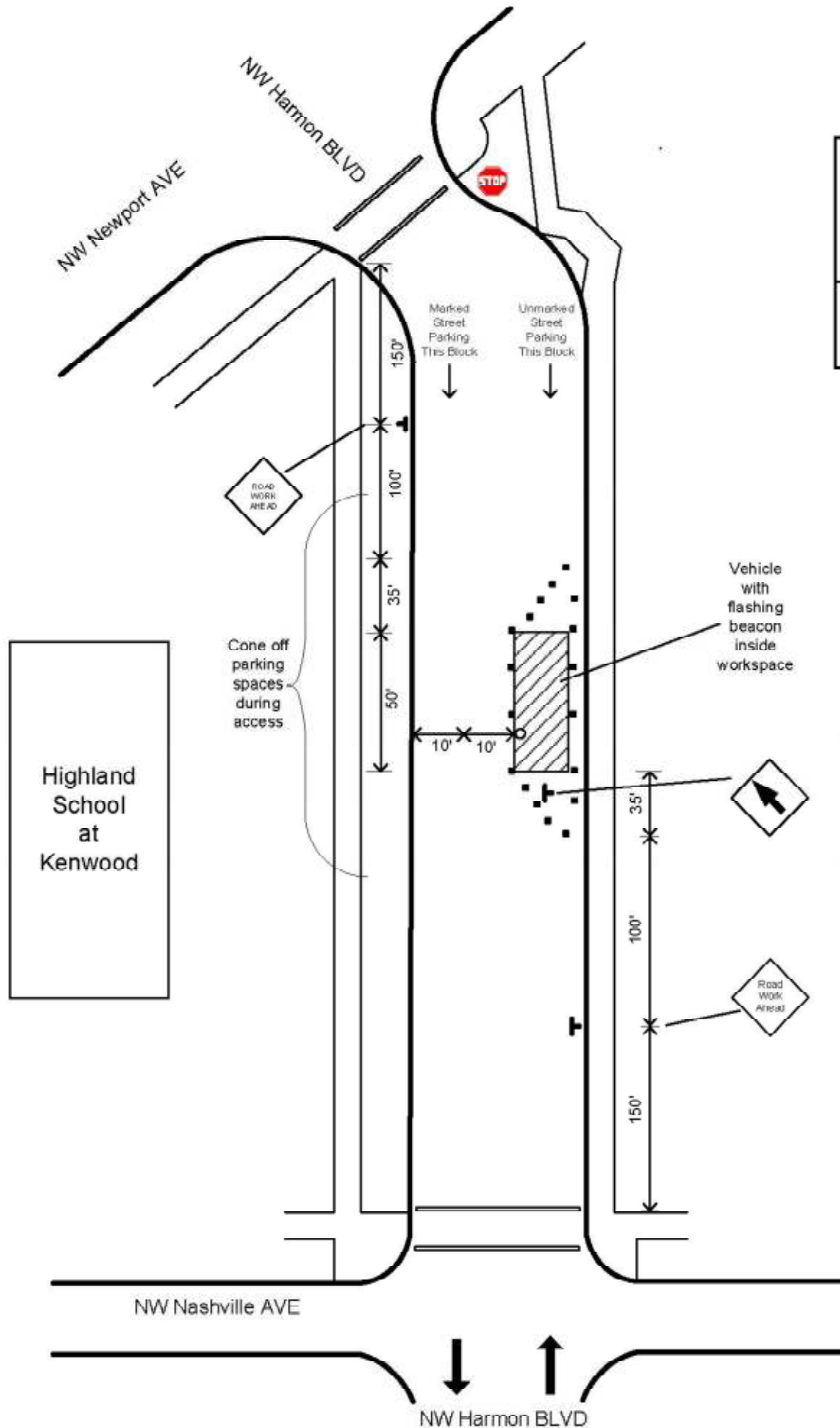
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/21/13





Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

Site Access  
02/14/13-04/13/13  
10:00am-3:00pm

1372

1336

1332

Posted Speed Limit	
SPEED LIMIT 25	SCHOOL SPEED LIMIT 20 7am-5pm



Bend\_008568

Site Access

**ADS ENVIRONMENTAL  
SERVICES®**



NW Harmon Blvd.

Site Location

Site access looking north



Bend\_008568

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



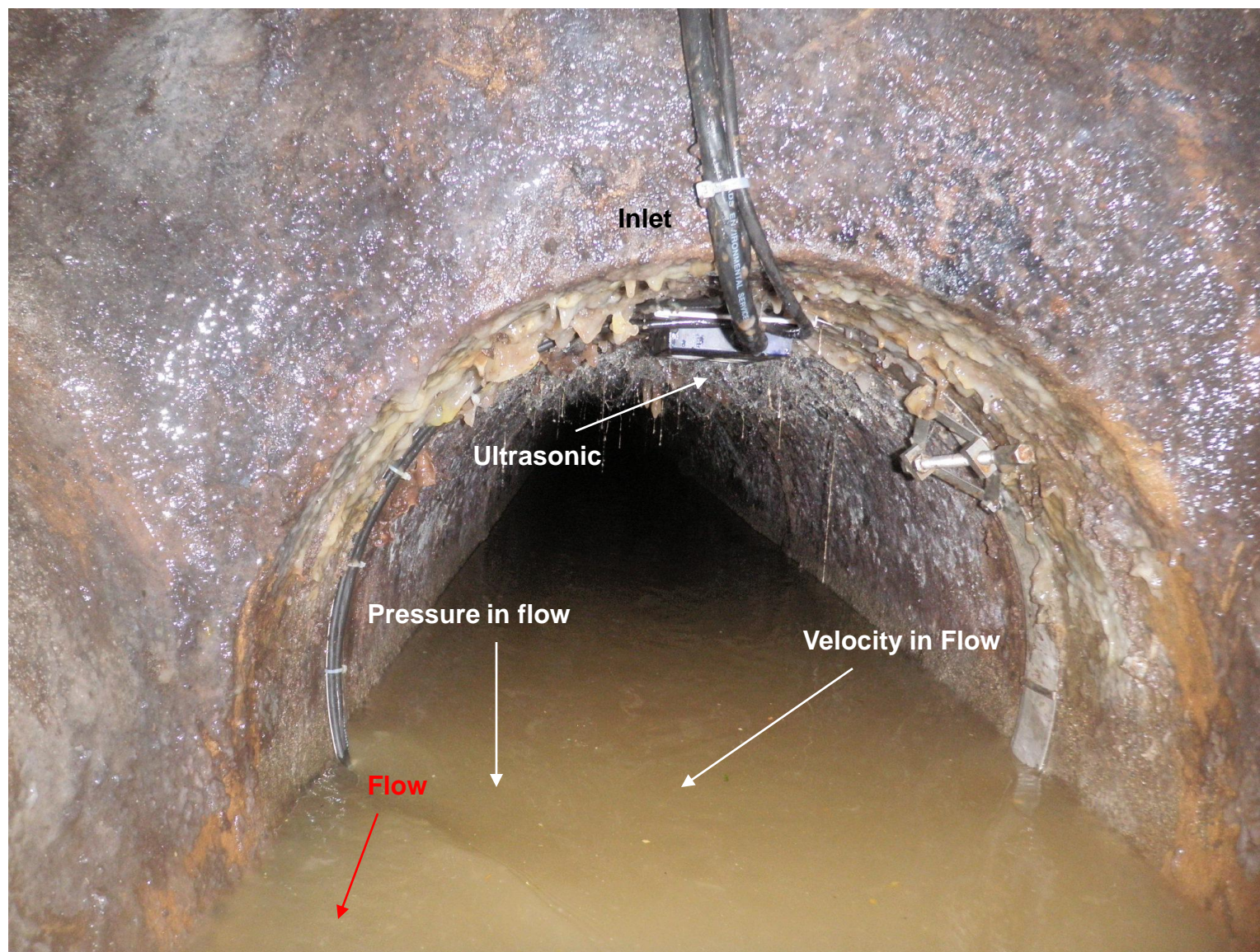
View of site looking north



Bend\_008568

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of inlet and sensors



Bend\_008568

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



Flow

View of outlet



# SCATTERGRAPH REPORT

Bend\_008568

## Flow Monitor

Bend\_008568

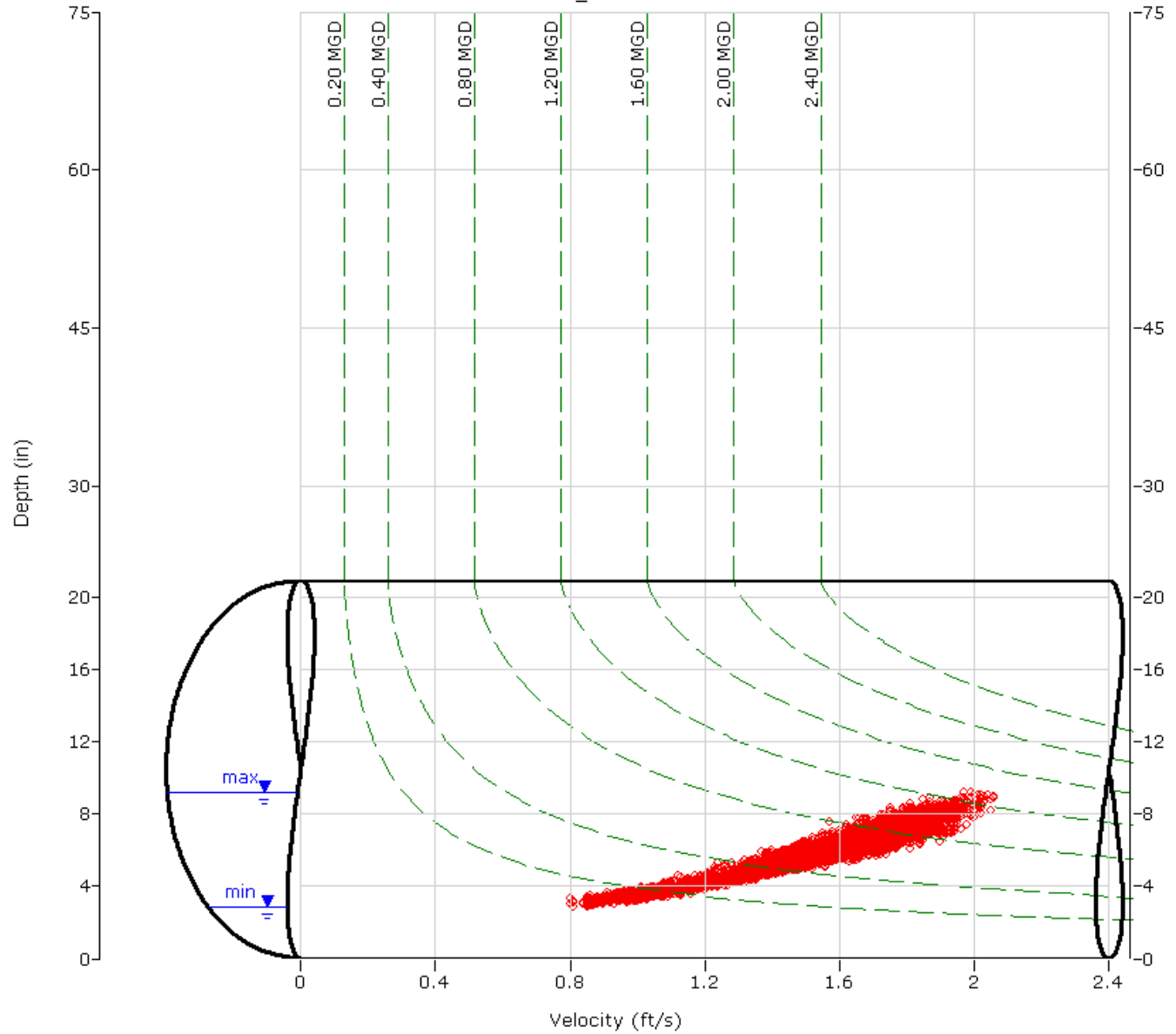
Pipe Height  
21.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_008568

## Flow Monitor

Bend\_008568

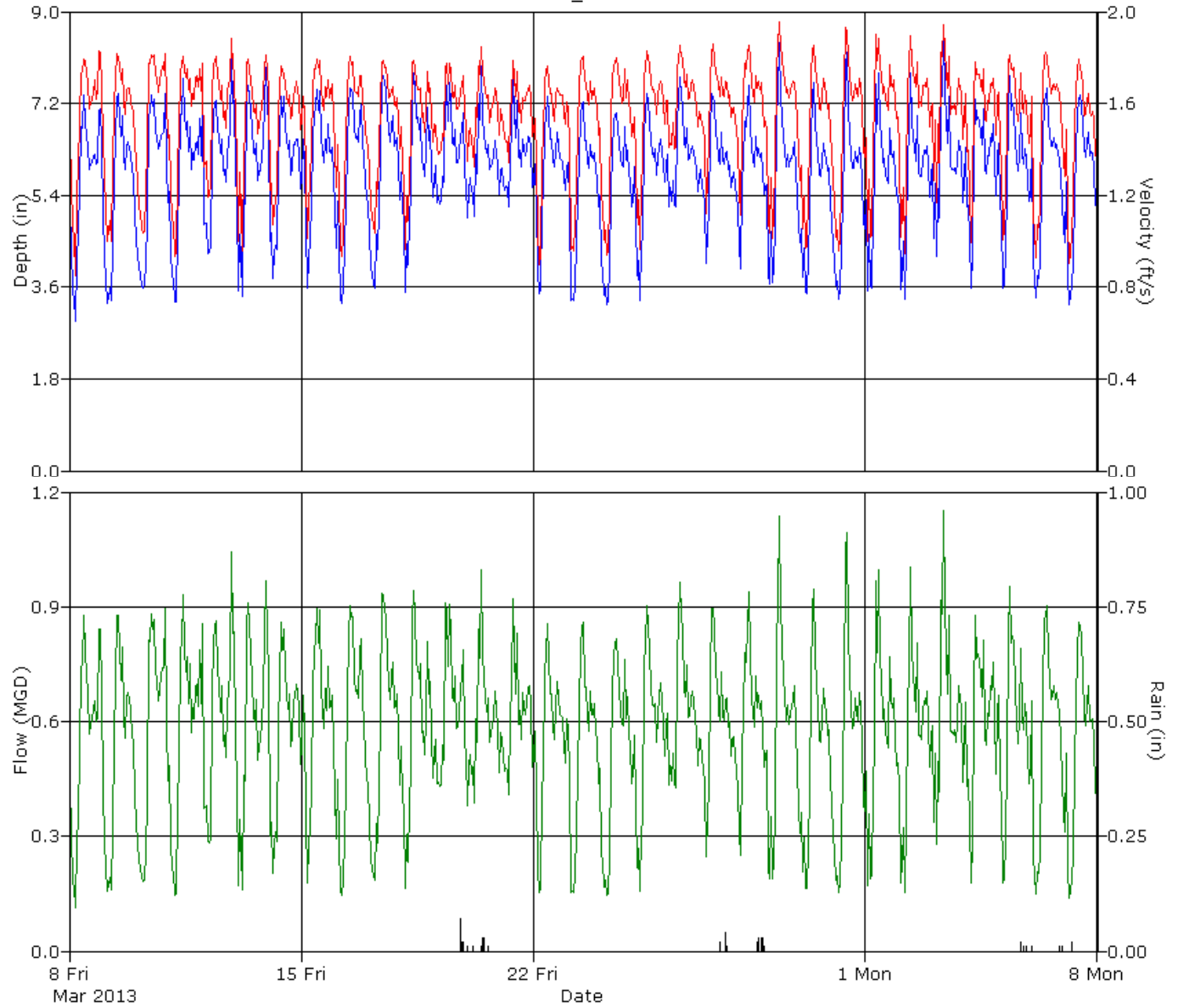
Pipe Height  
21.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_008693	
Measured Pipe Height (in)	8.13
Nominal Pipe Height (in)	8
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_008693 was located in the East of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a fairly repeatable data set with a near surcharge event occurring on March 12, 2013. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 8%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.28	2.27	0.061
Minimum	0.33	0.36	0.003
Maximum	7.91	4.67	1.079
Time of Minimum	3/16/2013 4:10 AM	3/27/2013 11:55 PM	3/15/2013 3:15 AM
Time of Maximum	3/12/2013 10:15 AM	3/12/2013 10:15 AM	3/12/2013 10:15 AM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Invalid velocity data, most likely as a result of clear flow during the minimum flow period, was flagged in the data set.

Percent Uptime (%)	
Depth	98
Velocity	98
Quantity	97

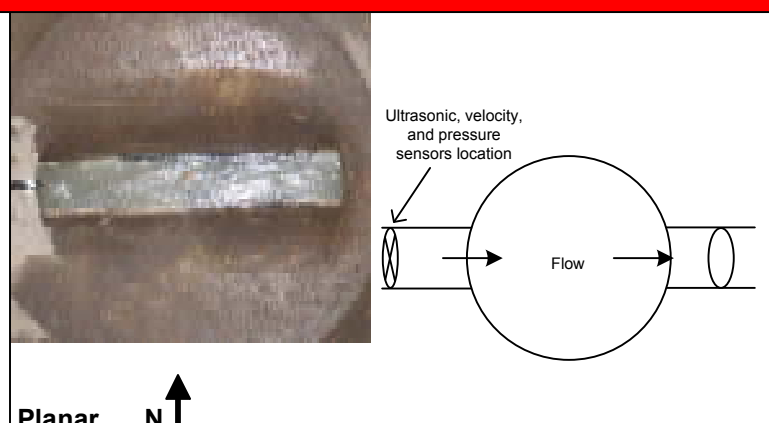
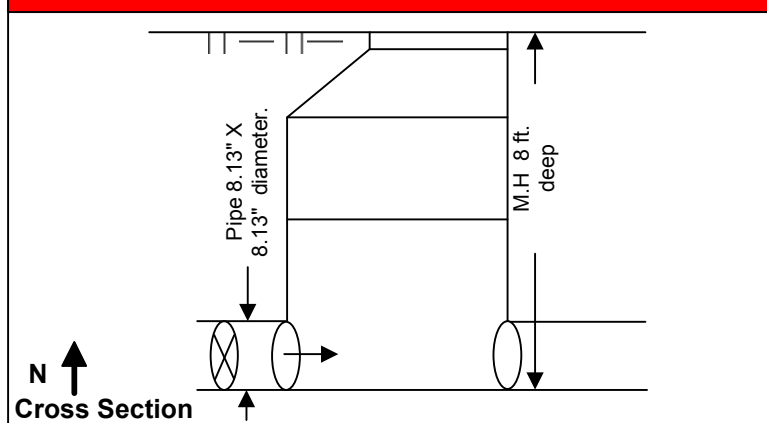


Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_008693		Monitor Series: 5000 AG		Monitor S/N: 21487	
Address/Location: 1053 NW Milwaukee Ave.		Manhole #		CMH008693	
		Coordinates:		44°03'41.58"N 121°19'38.82"W	
		Pipe Height:		8.13"	
Access: Drive		Type of System:		Pipe Width: 8.13"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.170.151	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	3/5/13 @ 14:26	Manhole Depth:	~ 8'
Site Hydraulics:	Small waves and fast flow	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No Influence	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	Did not investigate	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Did not investigate	Telephone Information:	Doesn't apply
Depth of Flow:	1.50" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	4.88" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	2.54 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0" Inches	Trench Length:	Doesn't apply Feet

### Other Information:



Installation Information		Backup		Yes	No	?	Distance
Installation Type: Standard		Trunk		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure		Lift / Pump Station		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed		WWTP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG		Other		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

### Additional Site Information / Comments:

5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_008693 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input checked="" type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs, access in and out of manhole must be performed by tripod only.  
Site located adjacent to intersection, follow all traffic plan procedures

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

<input type="checkbox"/>	This worksite does NOT require a traffic control Plan
<input type="checkbox"/>	Standard Traffic Control Plan is to be used at this work site
<input checked="" type="checkbox"/>	This site requires a special Traffic Control Plan which is attached

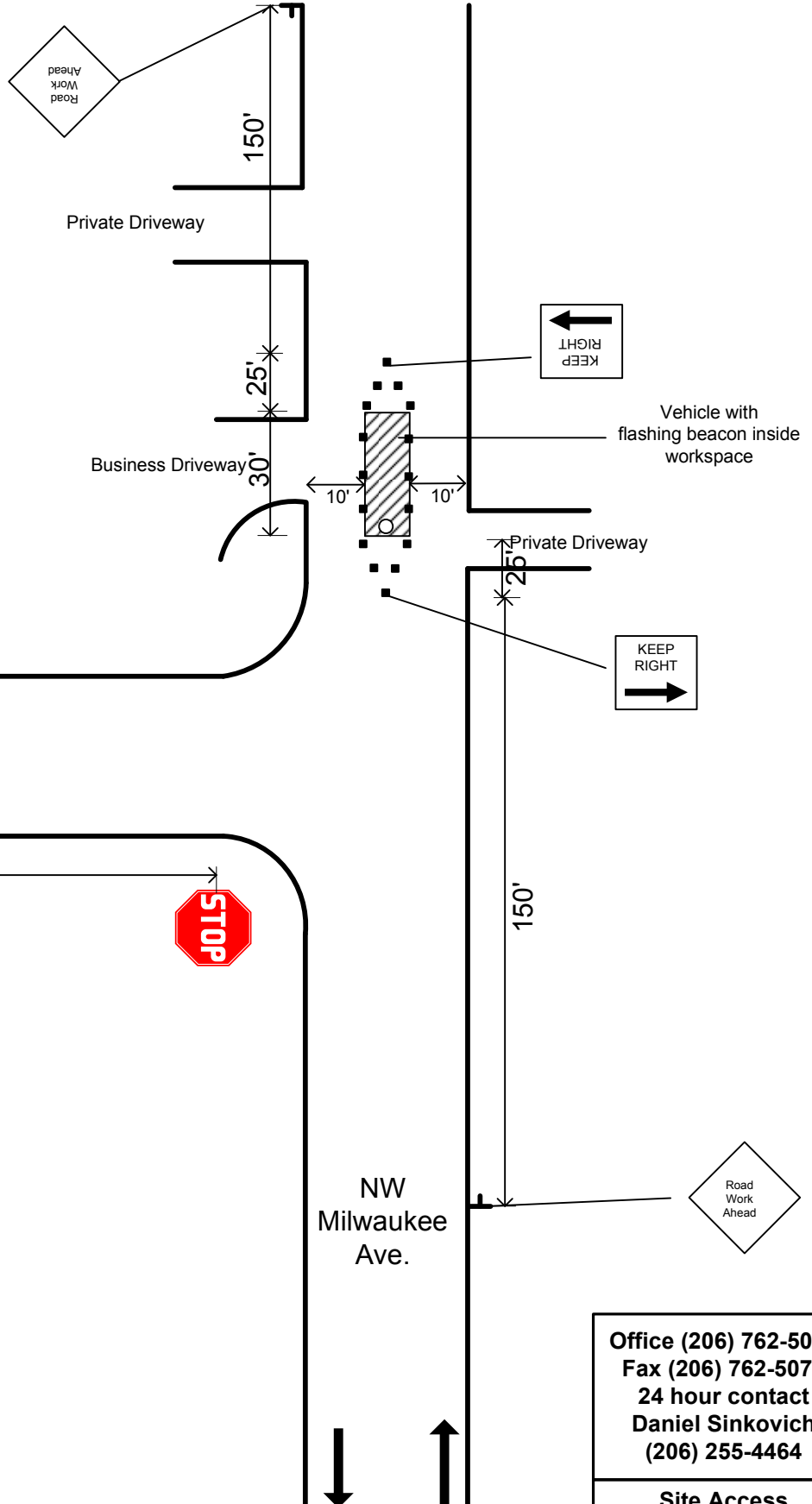
#### Approved

Field Mgr Name: Daniel Sinkovich  
Signature: Signed copy can be obtained from ADS  
Date: 3/5/13

#### Reviewed

Project Mgr Name: Mike Pina  
Signature: Signed copy can be obtained from ADS  
Date: 3/5/13





Posted Speed Limit

SPEED  
LIMIT  
**25**

Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

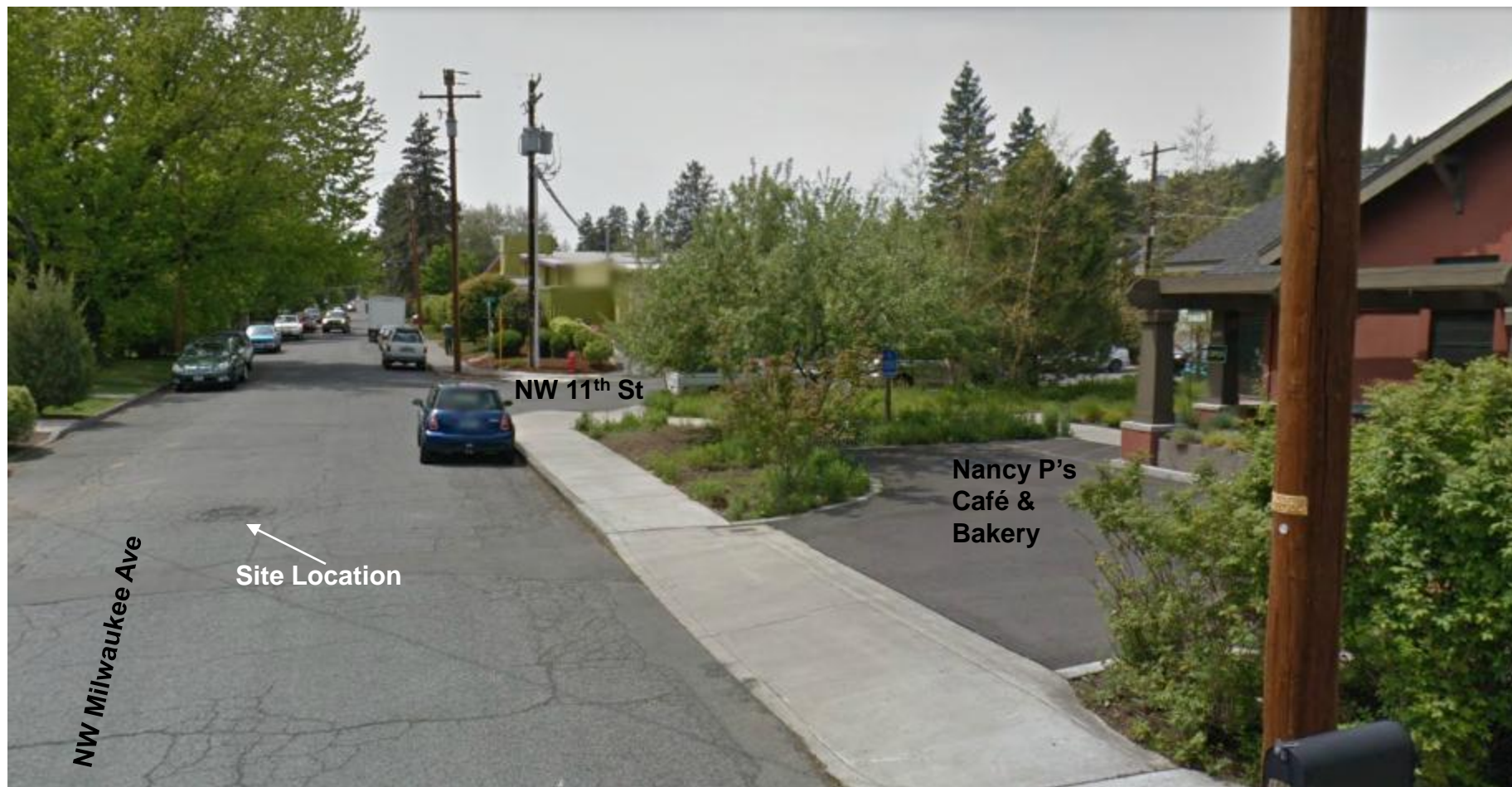
Site Access  
02/14/13-04/13/13  
7:00am-5:00pm



Bend\_008693

Site Access

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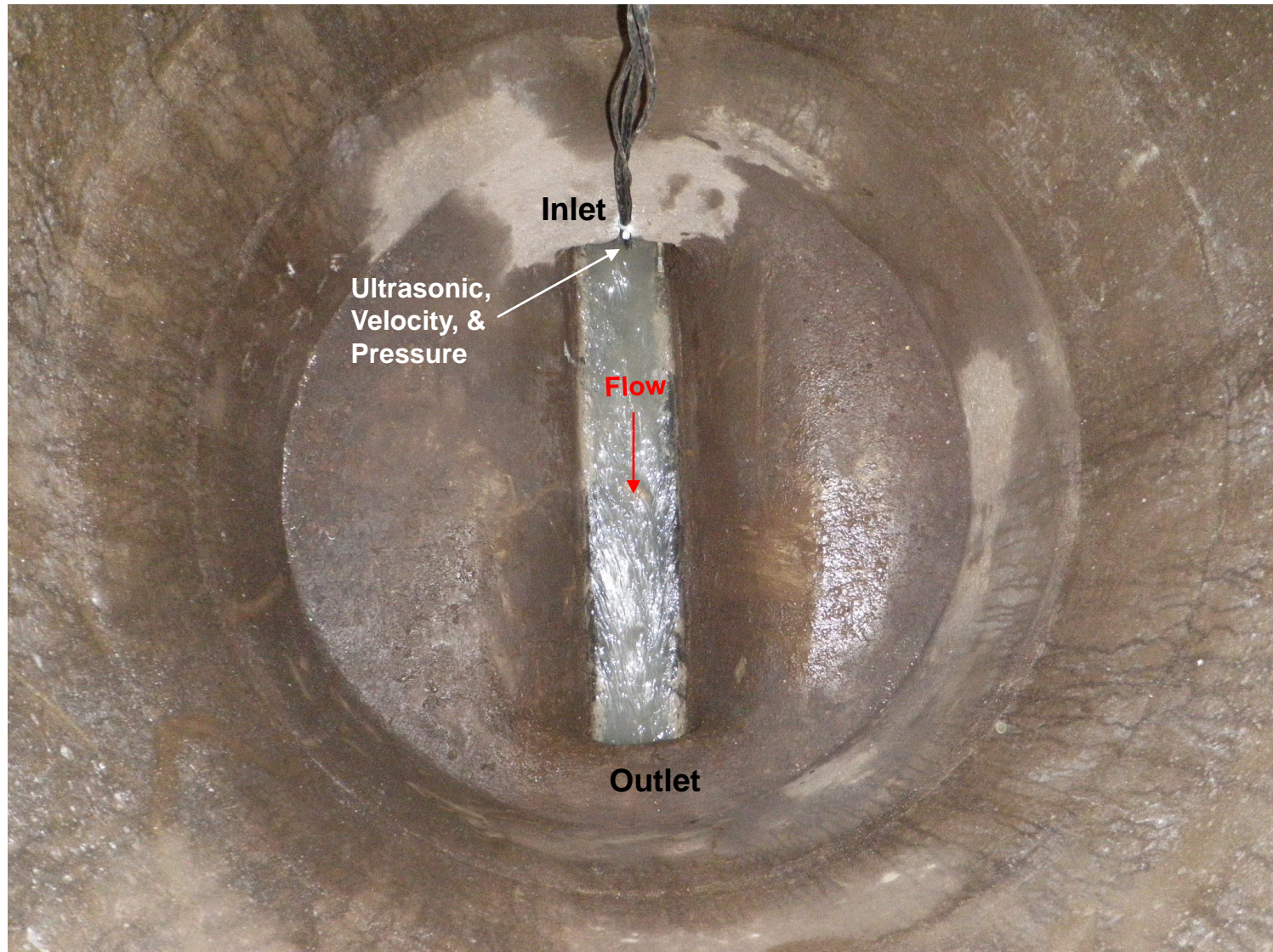
Site access looking west



Bend\_008693

Site set up

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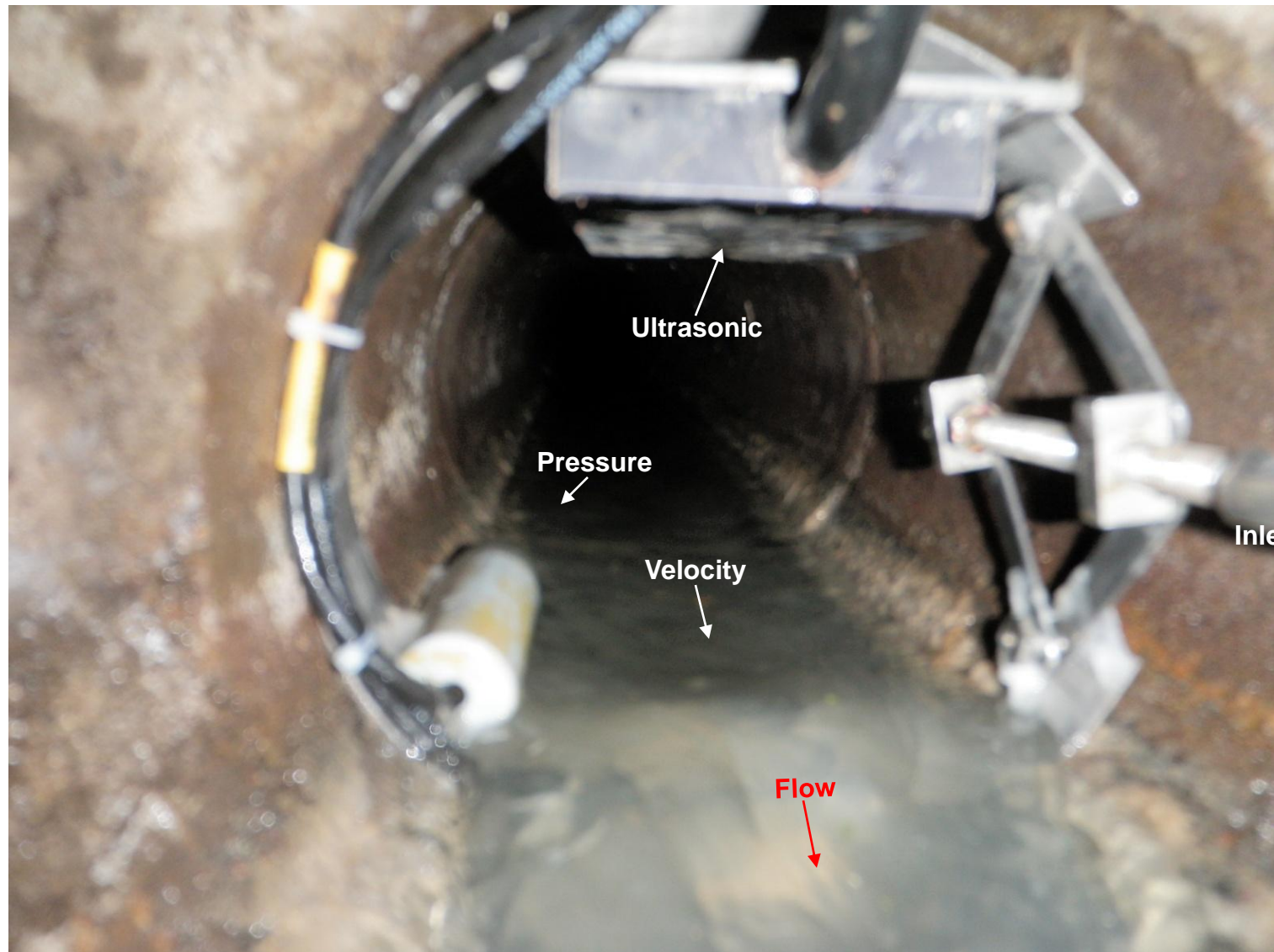
View of site looking west



Bend\_008693

Site set up

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View of inlet and sensors



Bend\_008693

Site set up

**ADS ENVIRONMENTAL  
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View of outlet



# SCATTERGRAPH REPORT

Bend\_008693

## Flow Monitor

Bend\_008693

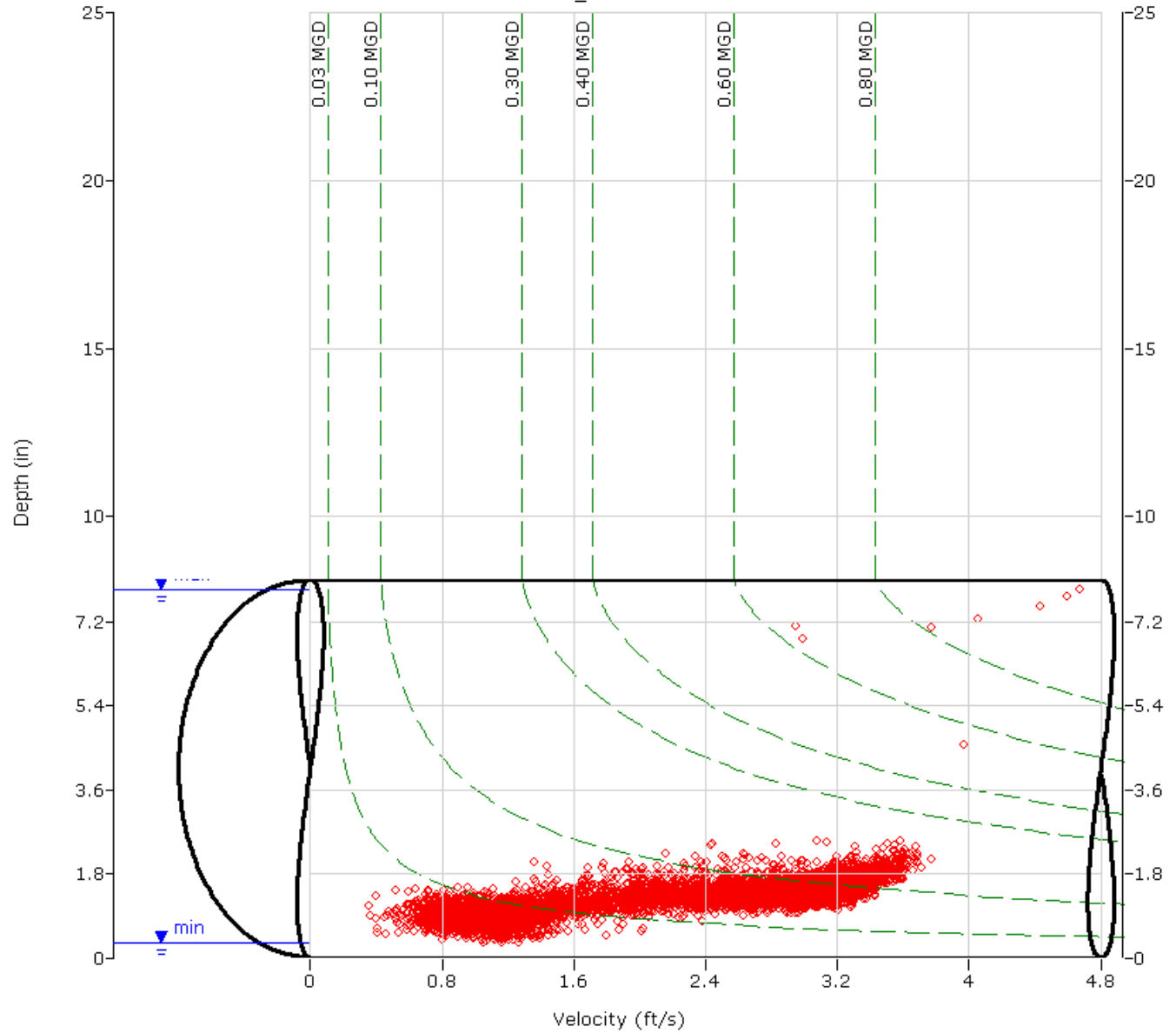
Pipe Height  
8.13 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_008693

## Flow Monitor

Bend\_008693

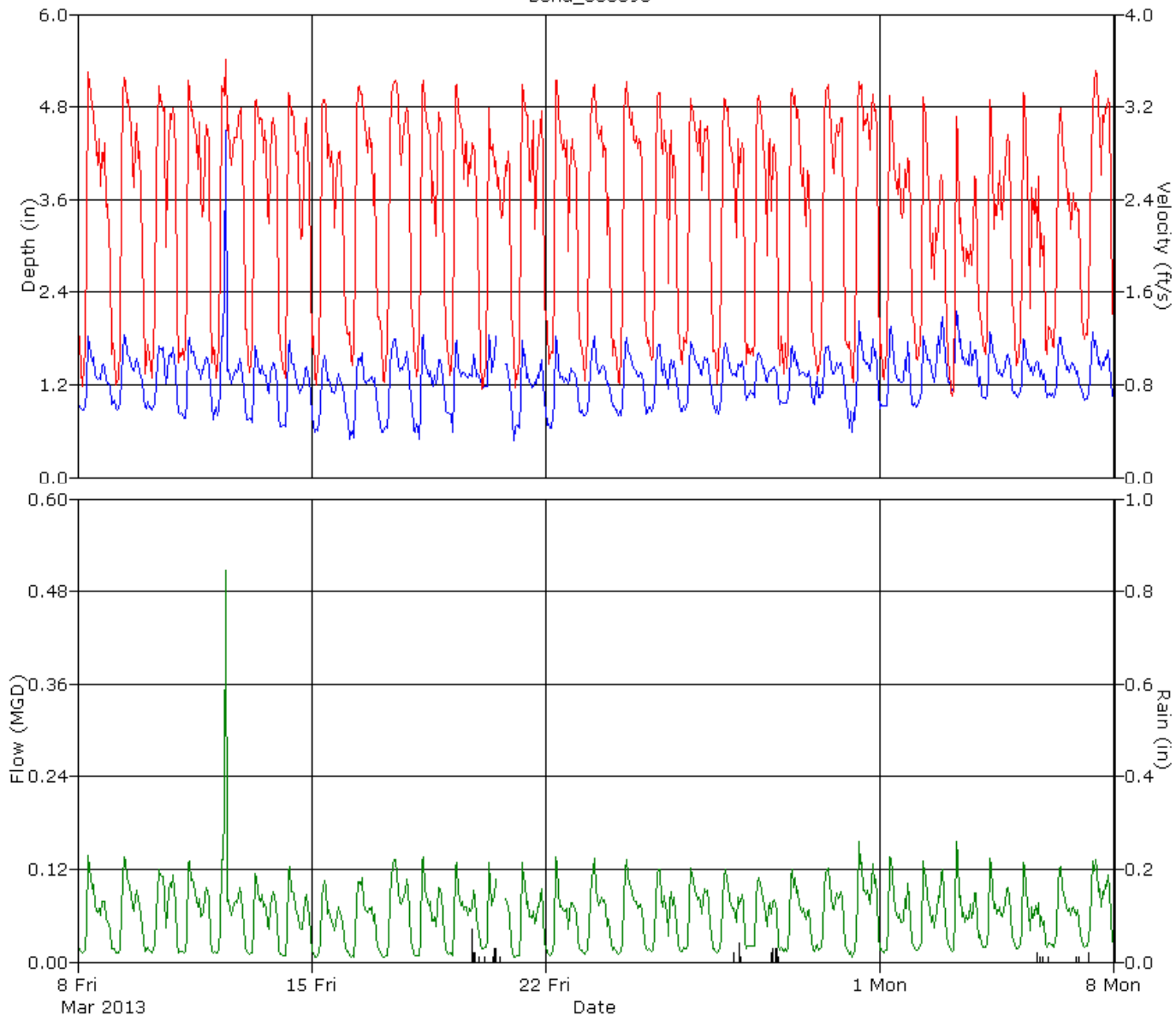
Pipe Height  
8.13 in.

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_008734	
Measured Pipe Height (in)	18
Nominal Pipe Height (in)	18
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_008734 was located in the West of Bend (see attached site report for details).

The hydrograph indicates a diurnal flow pattern with lift station influence during the period Friday, March 8, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a fairly repeatable data set, however a hydraulic jump appears at a depth of approximately 2.5" (between lift station on/off cycles) after March 27, 2013 and the data after this period should be used with caution. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location prior to March 27, 2013 is +/- 10%. The hydraulic jump appeared more severe after March 27, 2013 after the sensors were relocated to try and improve data quality.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 8, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 2-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.51	2.20	0.267
Minimum	0.67	0.54	0.011
Maximum	5.06	5.42	1.314
Time of Minimum	4/6/2013 3:52 AM	3/28/2013 1:00 AM	3/28/2013 3:08 AM
Time of Maximum	3/10/2013 12:45 PM	3/22/2013 1:30 PM	3/12/2013 8:05 PM

### Data Quality

The data uptime for the Friday, March 8, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 2-minute data points divided by the total number of 2-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	97
Velocity	97
Quantity	97



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_008734		Monitor Series: 5000 AG		Monitor S/N: 21692	
Address/Location: 1100 NW Newport Ave		Manhole #		CMH008734	
		Coordinates:		44°03'44.67"N 121°19'40.57"W	
		Pipe Height:		18.00"	
Access: Drive		Type of System:		Pipe Width: 18.00"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.49.181	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	3/7/2013 @ 11:07	Manhole Depth:	~ 5'
Site Hydraulics:	Ripples	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	L/S	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	Wavy	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	4.50" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	13.50" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	4.00 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
---

5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_008734 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input checked="" type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
Confined Space	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only.  
This site may be congested at peak hours. Perform all work during off-peak hours.

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Dan Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 3/7/13

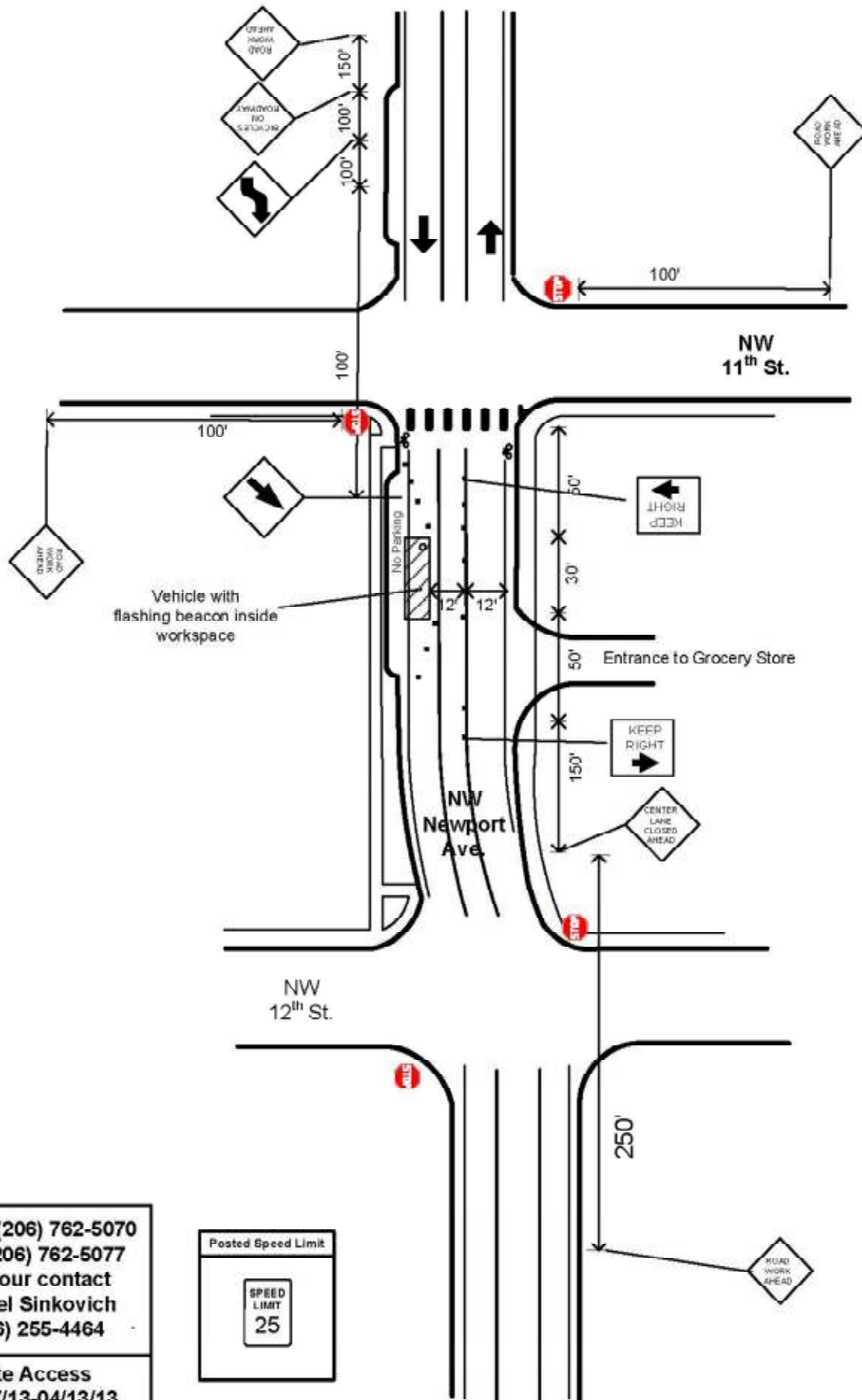
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

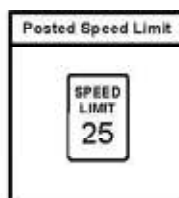
Date: 3/7/13





Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464

Site Access  
03/07/13-04/13/13  
7:00am - 4:00pm





Bend\_008734

Site location

**ADS ENVIRONMENTAL  
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Site access looking southwest



Bend\_008734

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



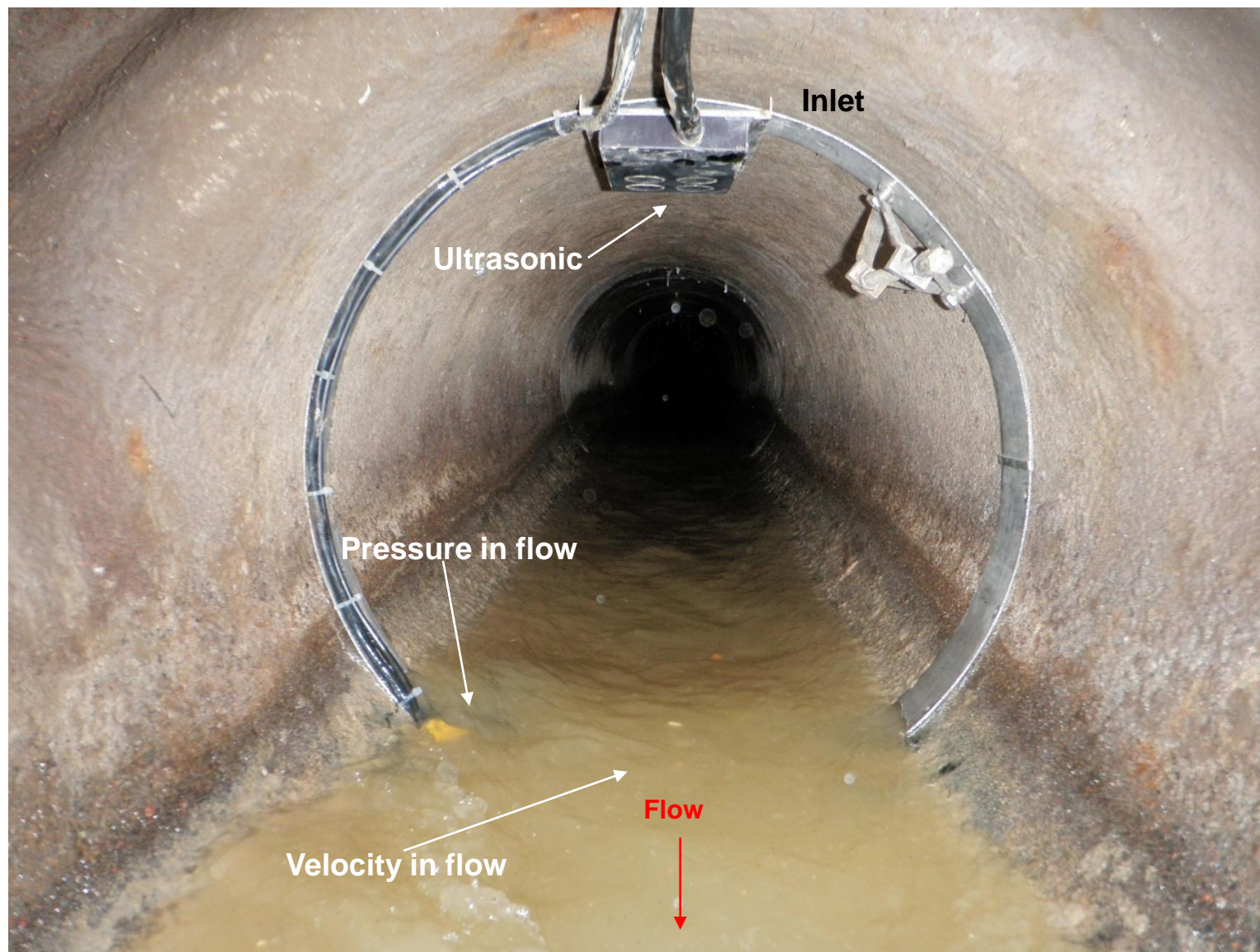
View down manhole facing north



Bend\_008734

Site set up

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**View of sensor placement and site hydraulics**



Bend\_008734

Site outlet

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_008734

## Flow Monitor

Bend\_008734

Pipe Height  
18.00 in

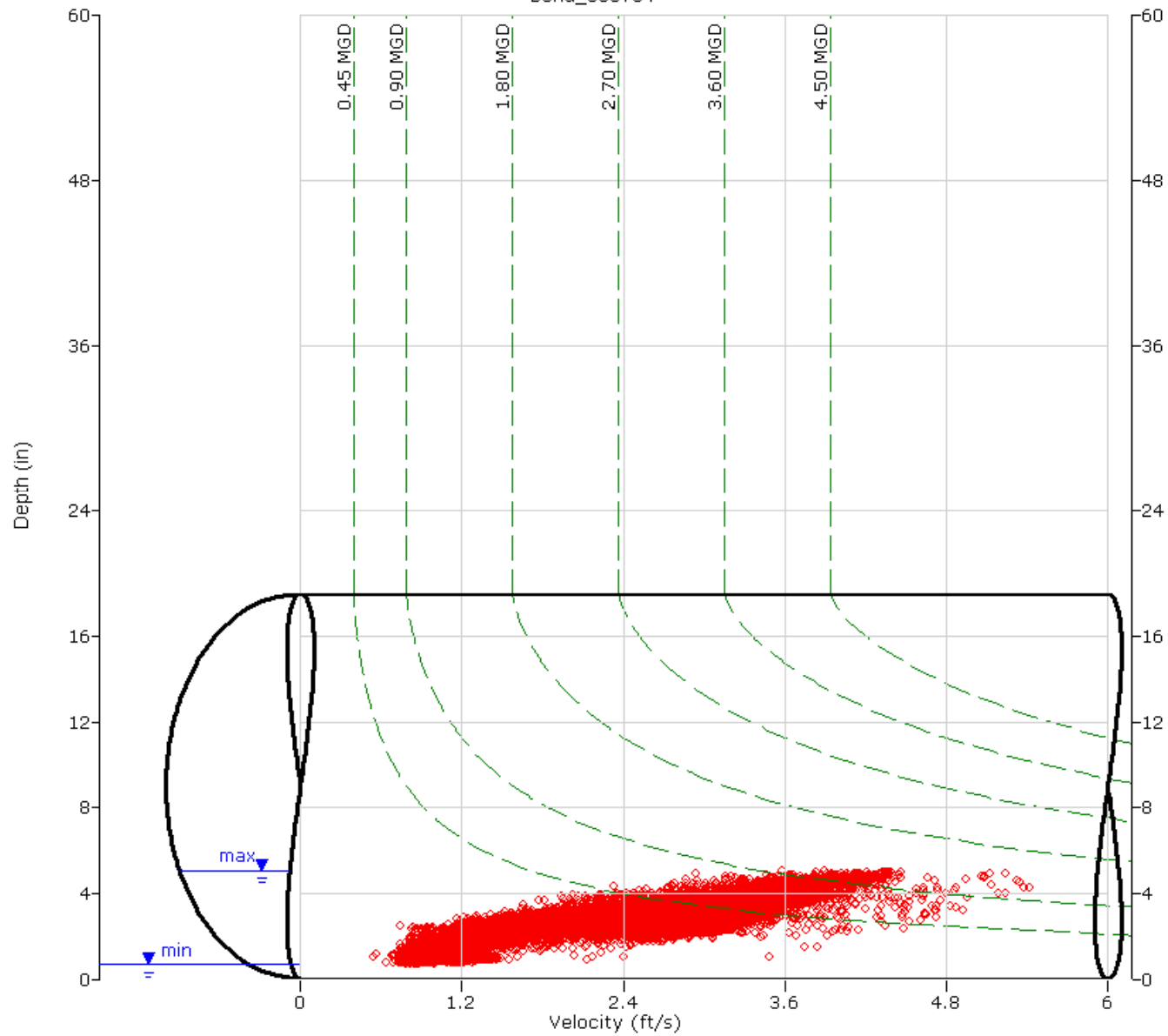
## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth

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# HYDROGRAPH REPORT

Bend\_008734

## Flow Monitor

Bend\_008734

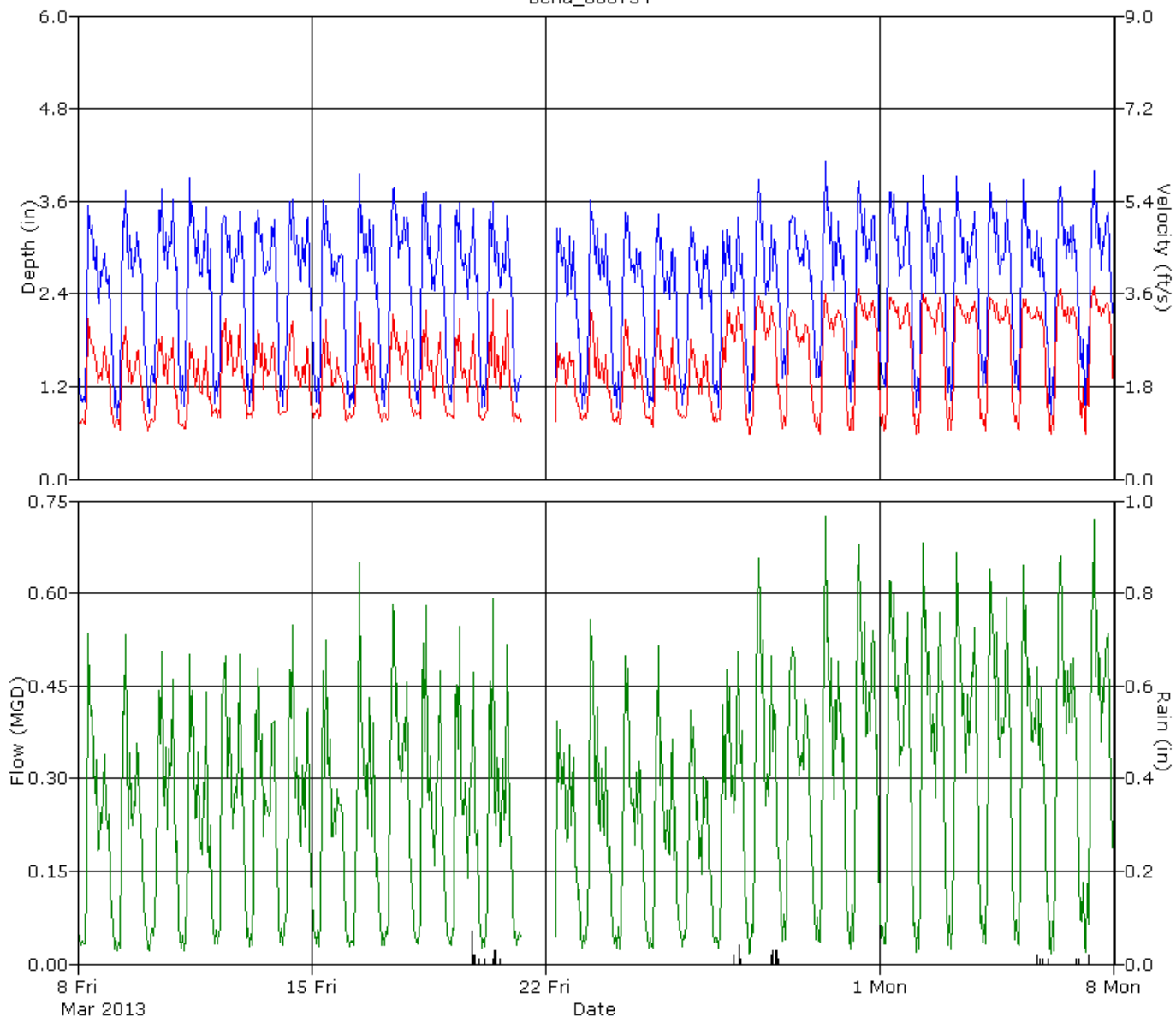
Pipe Height  
18.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

---

### Site Information

Bend_008986	
Measured Pipe Height (in)	9.75
Nominal Pipe Height (in)	10
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_008986 was located in the West of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.80	0.99	0.049
Minimum	0.66	0.21	0.003
Maximum	3.14	1.76	0.146
Time of Minimum	3/10/2013 5:40 AM	4/5/2013 2:20 AM	3/10/2013 3:35 AM
Time of Maximum	4/3/2013 7:25 AM	3/16/2013 11:40 AM	3/23/2013 8:45 AM

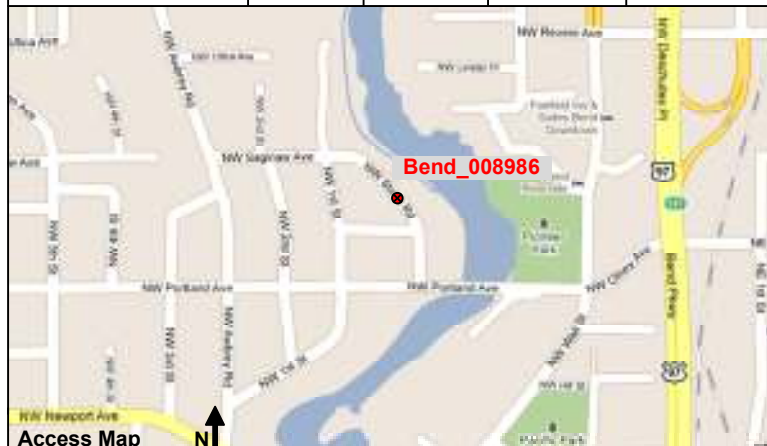
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100

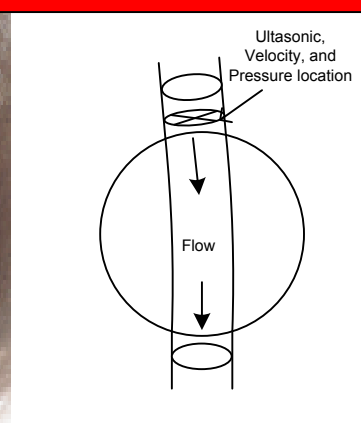
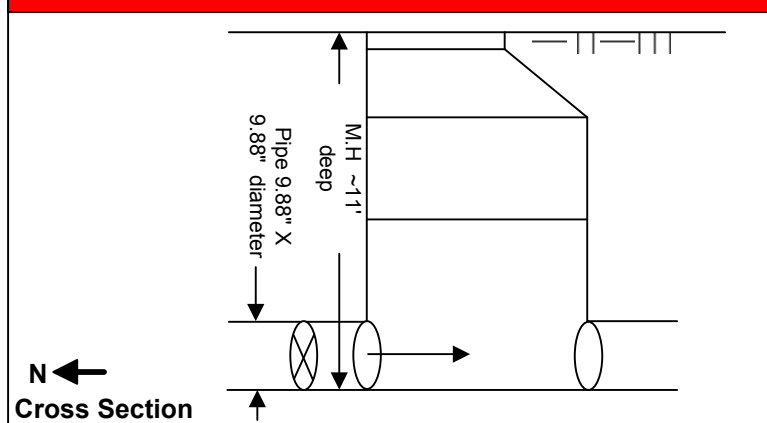


Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_008986		Monitor Series: 5000 AG		Monitor S/N: 14209	
Address/Location: 1715 NW Steidl Rd		Manhole #		CMH008986	
		Coordinates:		44° 03' 54.59" N 121° 18' 44.02" W	
		Pipe Height:		9.75"	
Access: Drive		Type of System:		Sanitary <input checked="" type="checkbox"/> Storm <input type="checkbox"/> Combined <input type="checkbox"/>	
		Pipe Width:		9.88"	
		IP Address:		166.219.172.63	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	3/7/13 @ 12:50	Manhole Depth:	~ 11'
Site Hydraulics:	Low, Slow, Wavy	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	Gravity Flow	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	DNI	Mini System Character:	Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	2.00" +/- .25"	Access Pole #:	Doesn't apply
Range (Air DOF):	7.75 +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.26 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

### Other Information:



Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

### Additional Site Information / Comments:



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_008986 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site has no usable rungs. Manhole access by tripod only.

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 3/7/13

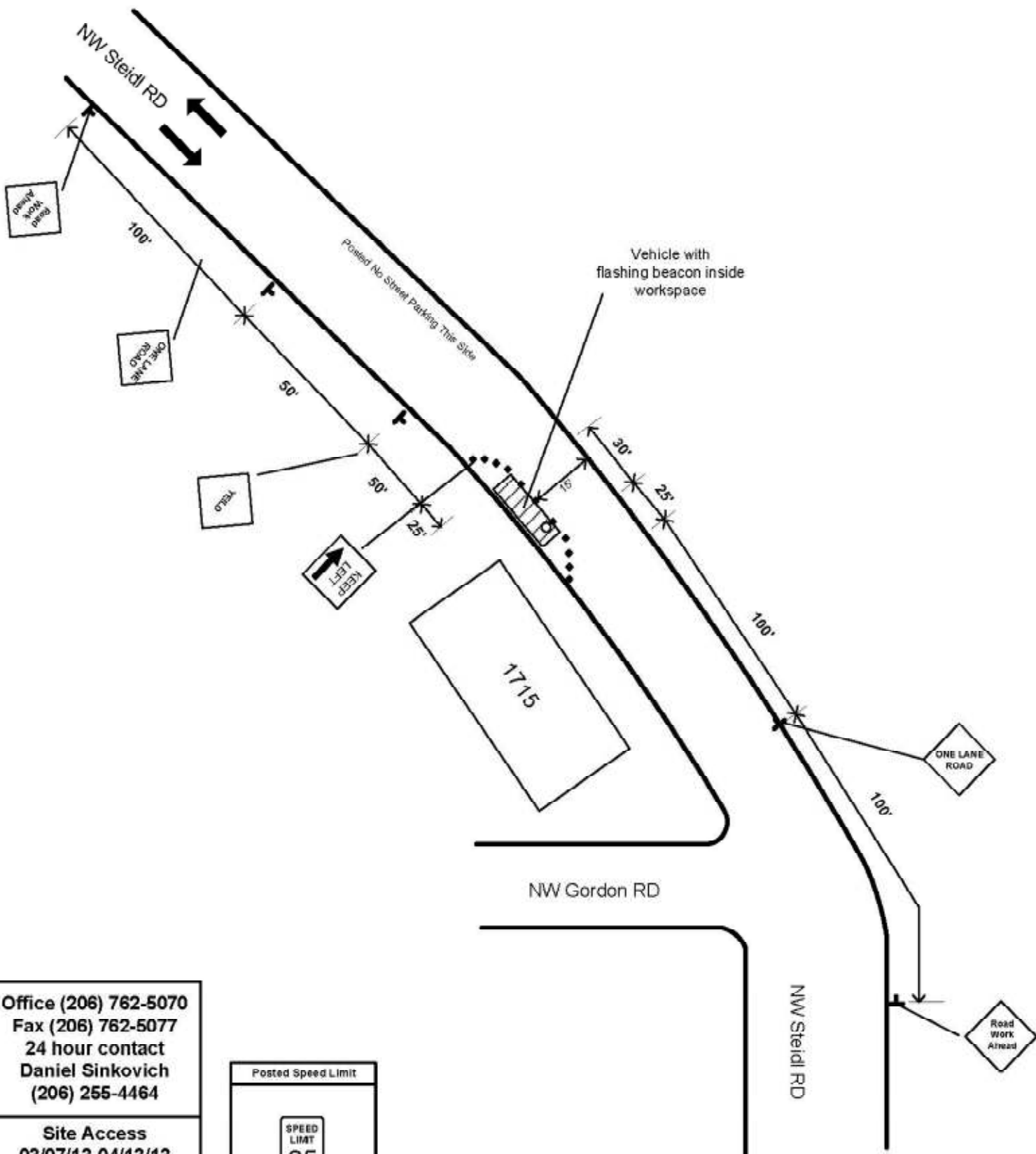
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 3/7/13





Office (206) 762-5070  
 Fax (206) 762-5077  
 24 hour contact  
 Daniel Sinkovich  
 (206) 255-4464

Site Access  
 03/07/13-04/13/13  
 7:00am-4:00pm

Posted Speed Limit

SPEED LIMIT  
 25



Bend\_008986

Site location

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SERVICES®**



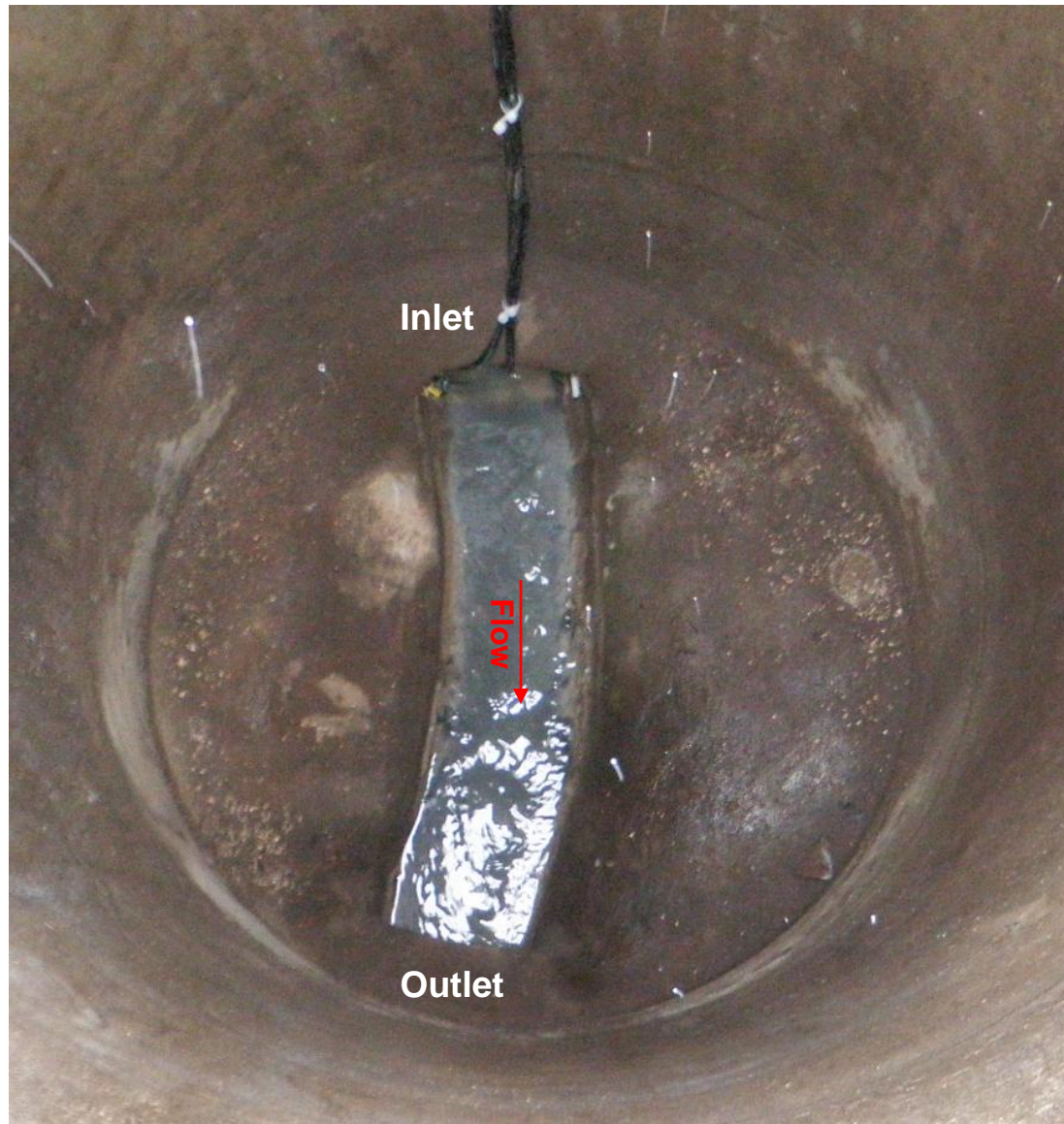
Site access looking northwest



Bend\_008986

Site set up

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SERVICES®



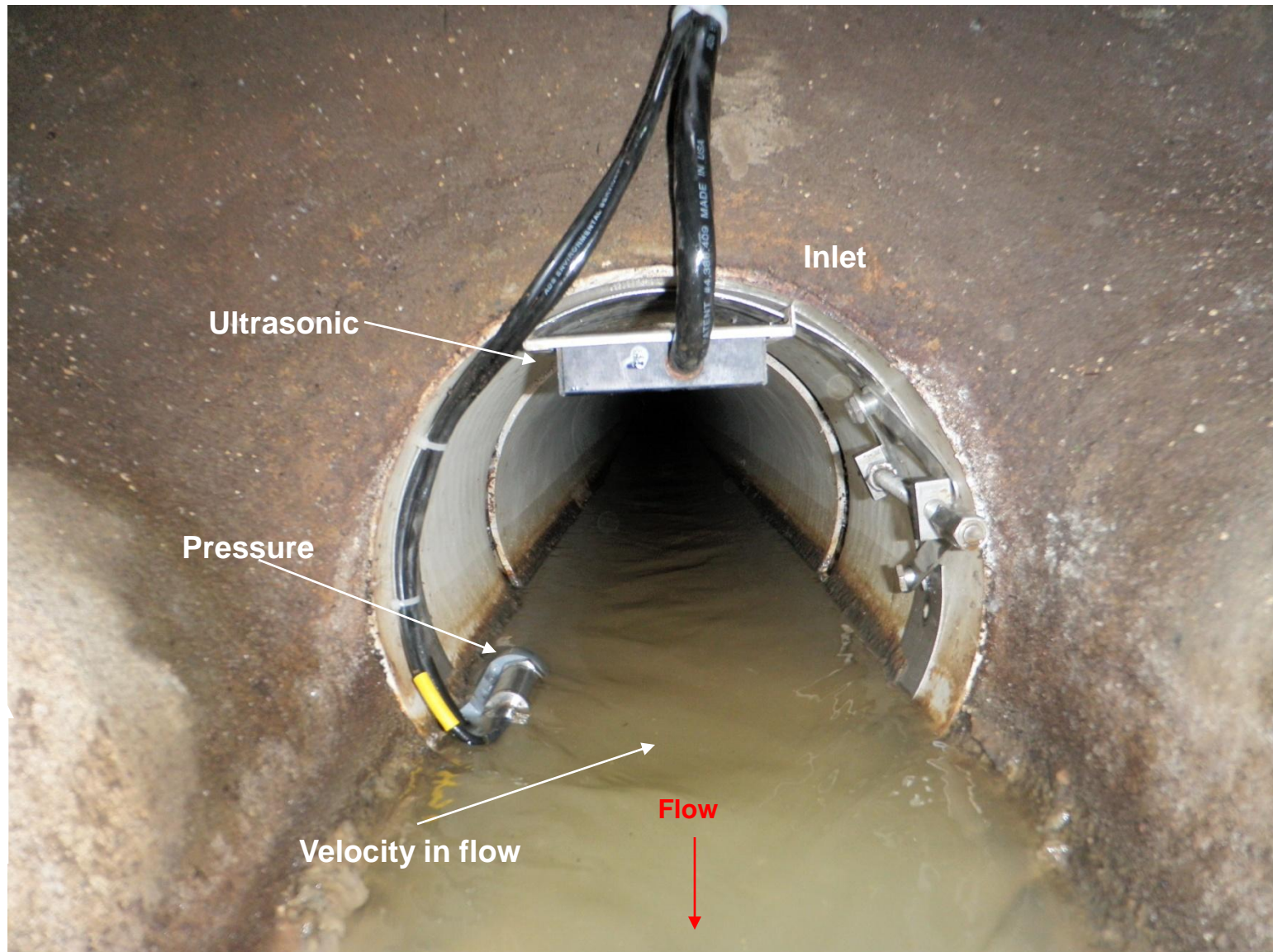
View down manhole facing north



Bend\_008986

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



**View of sensor placement and site hydraulics**



Bend\_008986

Site outlet

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_008986

## Flow Monitor

Bend\_008986

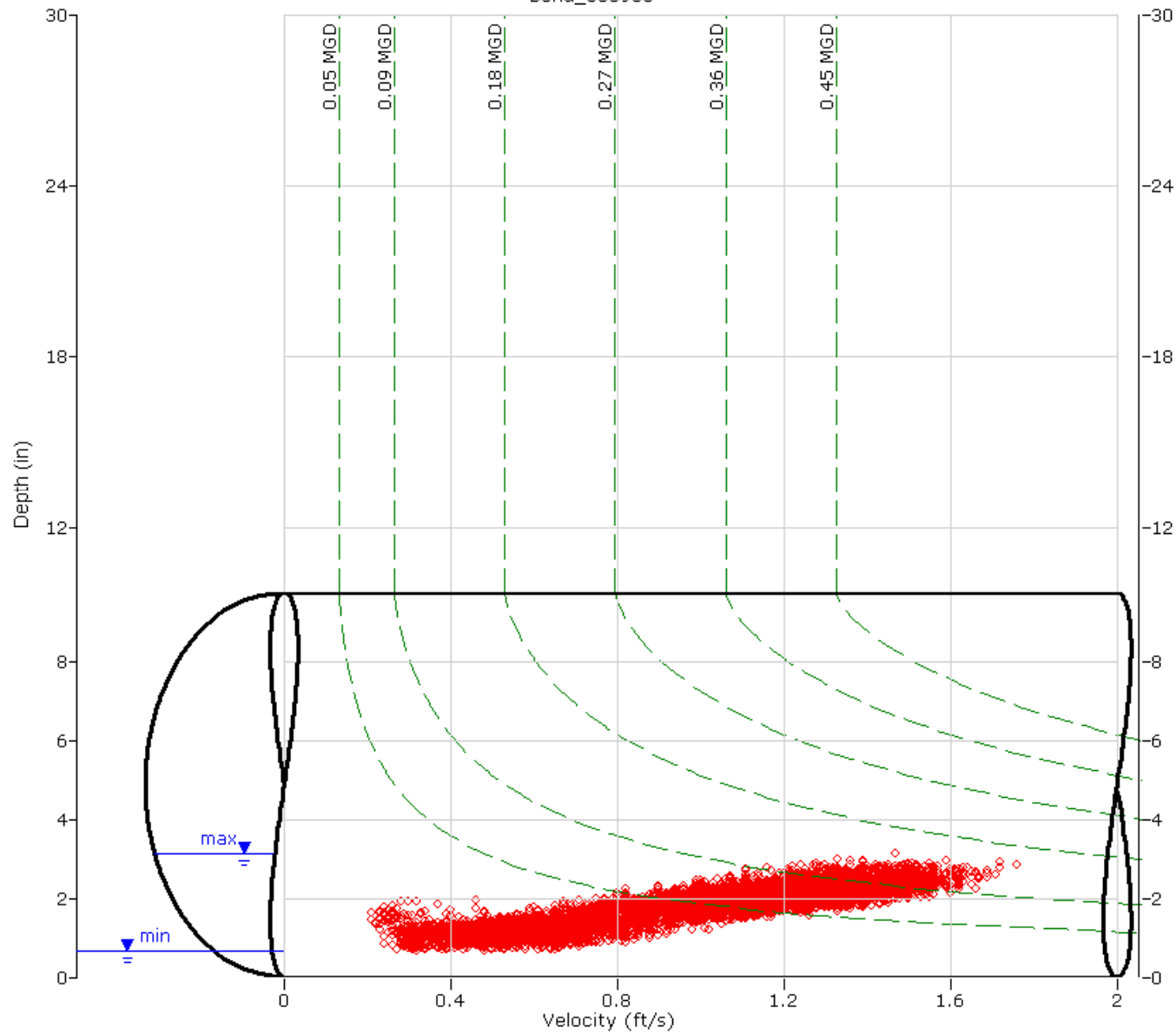
Pipe Height  
9.75 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_008986

## Flow Monitor

Bend\_008986

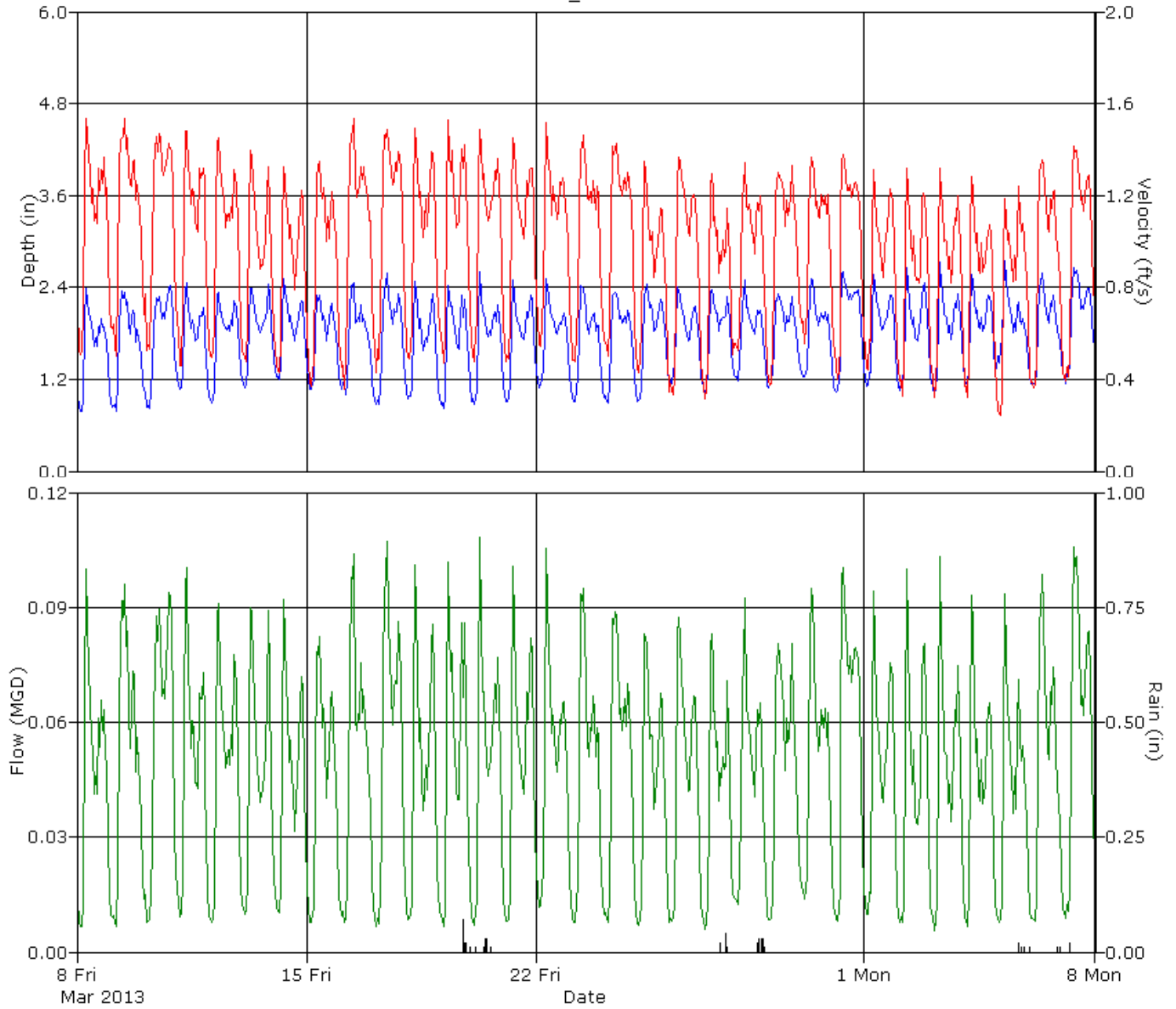
Pipe Height  
9.75 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_009287	
Measured Pipe Height (in)	9.88
Nominal Pipe Height (in)	10
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_009287 was located in the West of Bend (see attached site report for details).

The hydrograph indicates a residential/commercial diurnal flow pattern during the period Friday, March 08, 2013 to Sunday, April 07, 2013. A discharge was evident on March 17, 2013. The scattergraph for this location indicates a fairly repeatable data set however the scattergraph is somewhat vertical (1" depth range with 0.5 - 4ft/s velocity range). The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 8%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.36	1.77	0.052
Minimum	1.11	0.31	0.008
Maximum	2.99	3.94	0.239
Time of Minimum	3/16/2013 11:35 PM	3/24/2013 5:35 AM	3/11/2013 3:25 AM
Time of Maximum	3/17/2013 9:00 AM	3/12/2013 12:15 PM	3/17/2013 9:15 AM

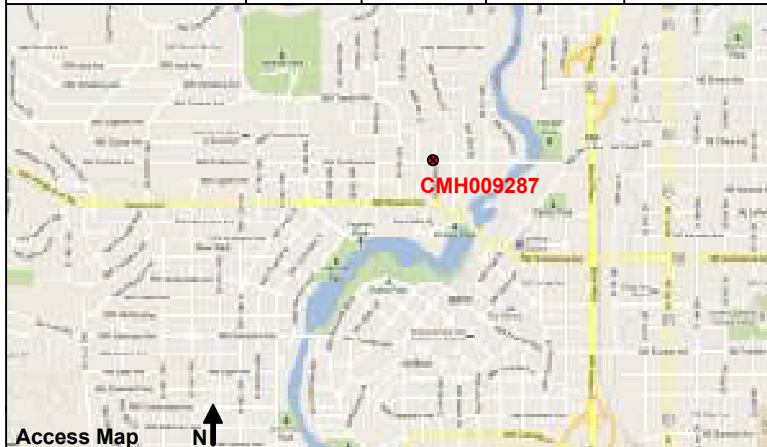
### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS		
Site Name: Bend_009287		Monitor Series: 5000 AG		Monitor S/N: 21713		
Address/Location: Intersection of NW 3 <sup>rd</sup> St. and NW Portland Ave.		Manhole #		CMH009287		
		Coordinates:		44° 3'50.96"N 121°19'0.56"W		
		Pipe Height:		9.88"		
Access: Drive	Type of System:	Sanitary	Storm	Combined	Pipe Width:	
		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.88"	
					IP Address:	166.219.172.3



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/28/13 @ 10:57	Manhole Depth:	~ 8'
Site Hydraulics:	Small waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No influence	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	Smooth, slow	Mini System Character:	<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	1.50" +/- .25"	Access Pole #:	Doesn't apply
Range (Air DOF):	8.38 +/- .25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	2.60 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Pipe 9.88" X 9.88" diameter.</p> <p>M.H. ~ 8 ft. deep</p> <p>N ↑</p> <p>Cross Section</p>	<p>Ultrasonic, Pressure, Velocity location</p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None Observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 psi pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_009287 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☐ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☒ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/28/13

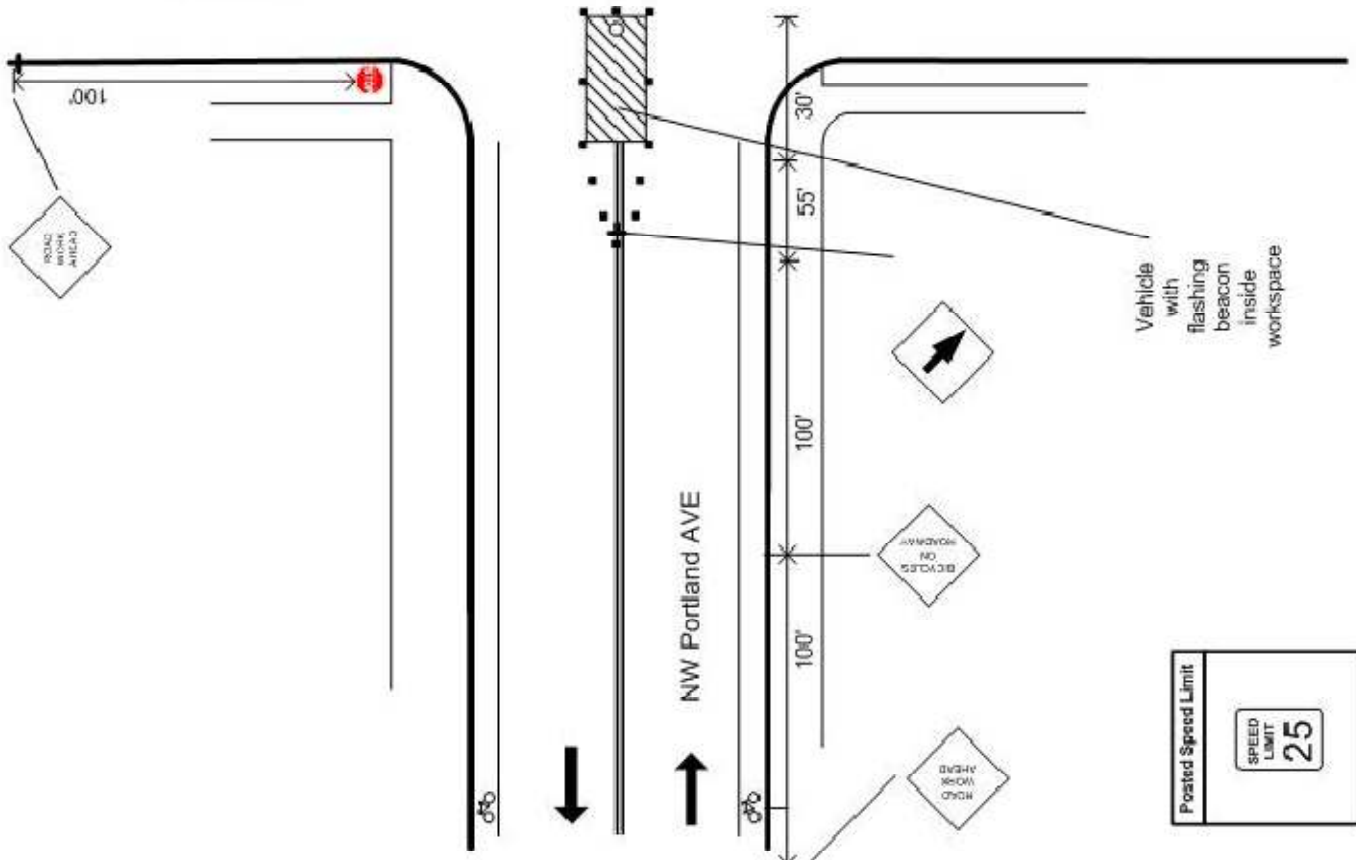
#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/28/13





Posted Speed Limit  
**25**

Site Access  
02/28/13-04/13/13  
10:00am-4:00pm

Office (206) 762-5070  
Fax (206) 762-5077  
24 hour contact  
Daniel Sinkovich  
(206) 255-4464



Bend\_009287

Site location

**ADS ENVIRONMENTAL  
SERVICES®**



Site access

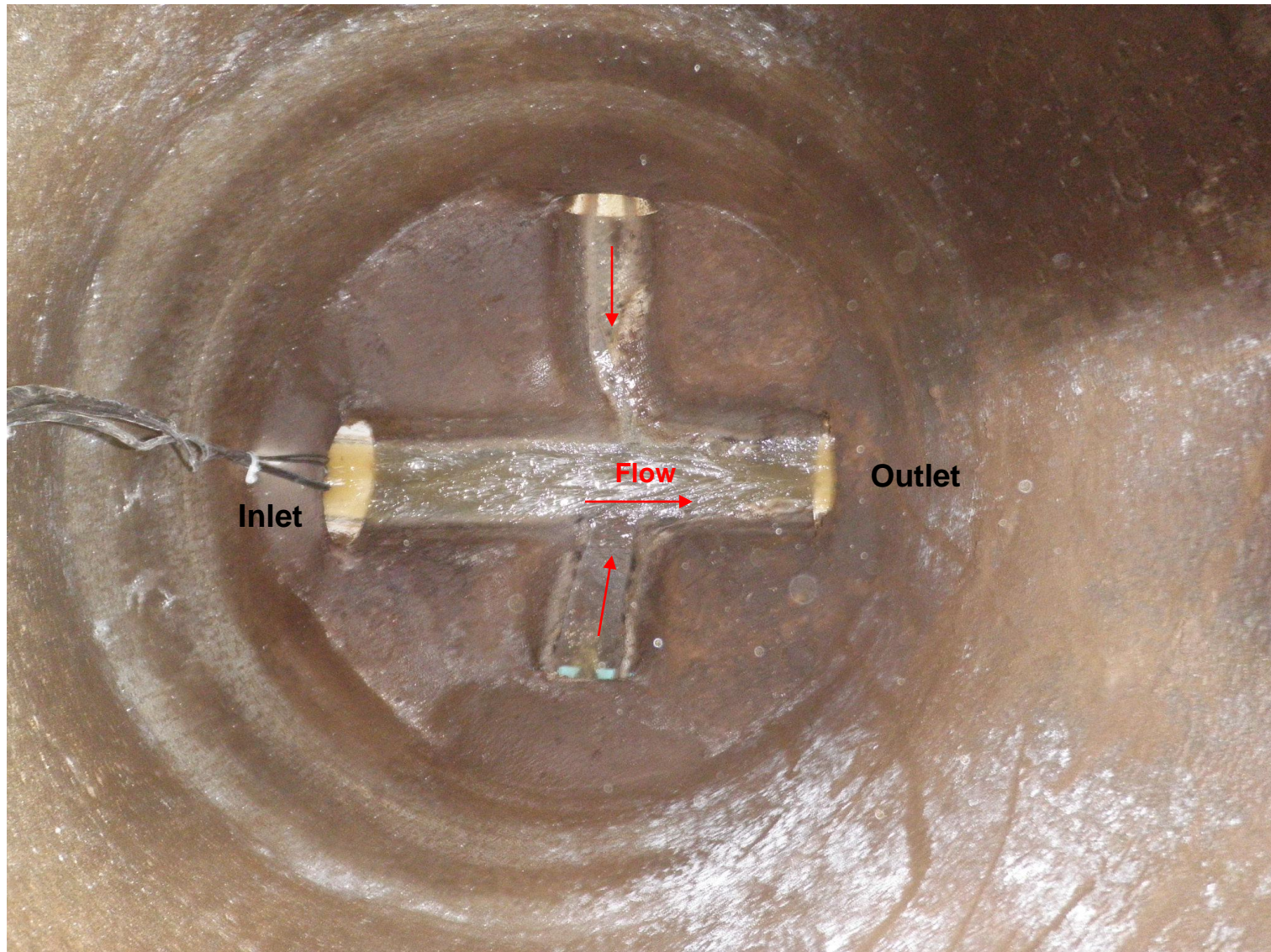
Site access looking northwest



Bend\_009287

Site set up

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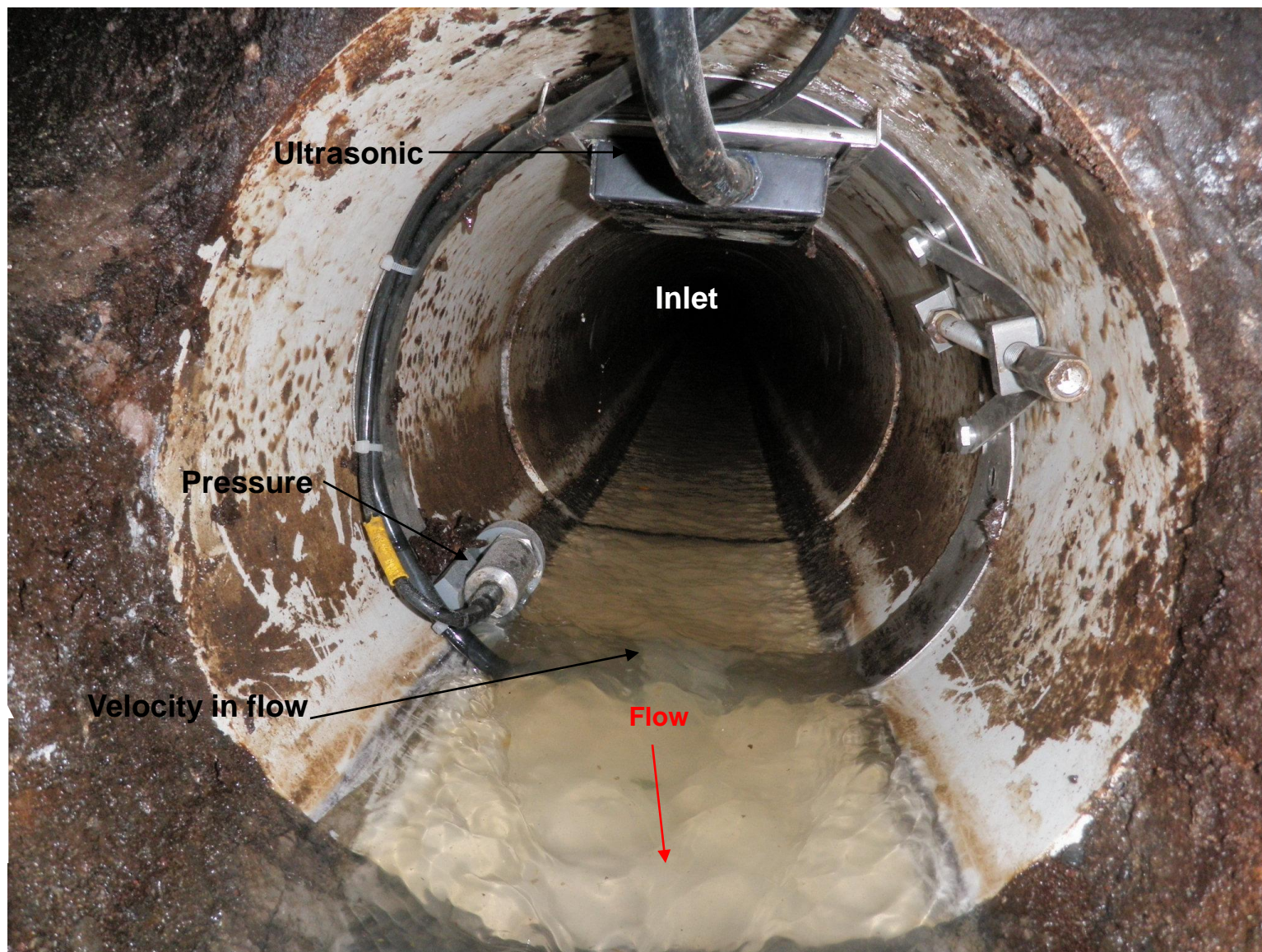
View down manhole facing north



Bend\_009287

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



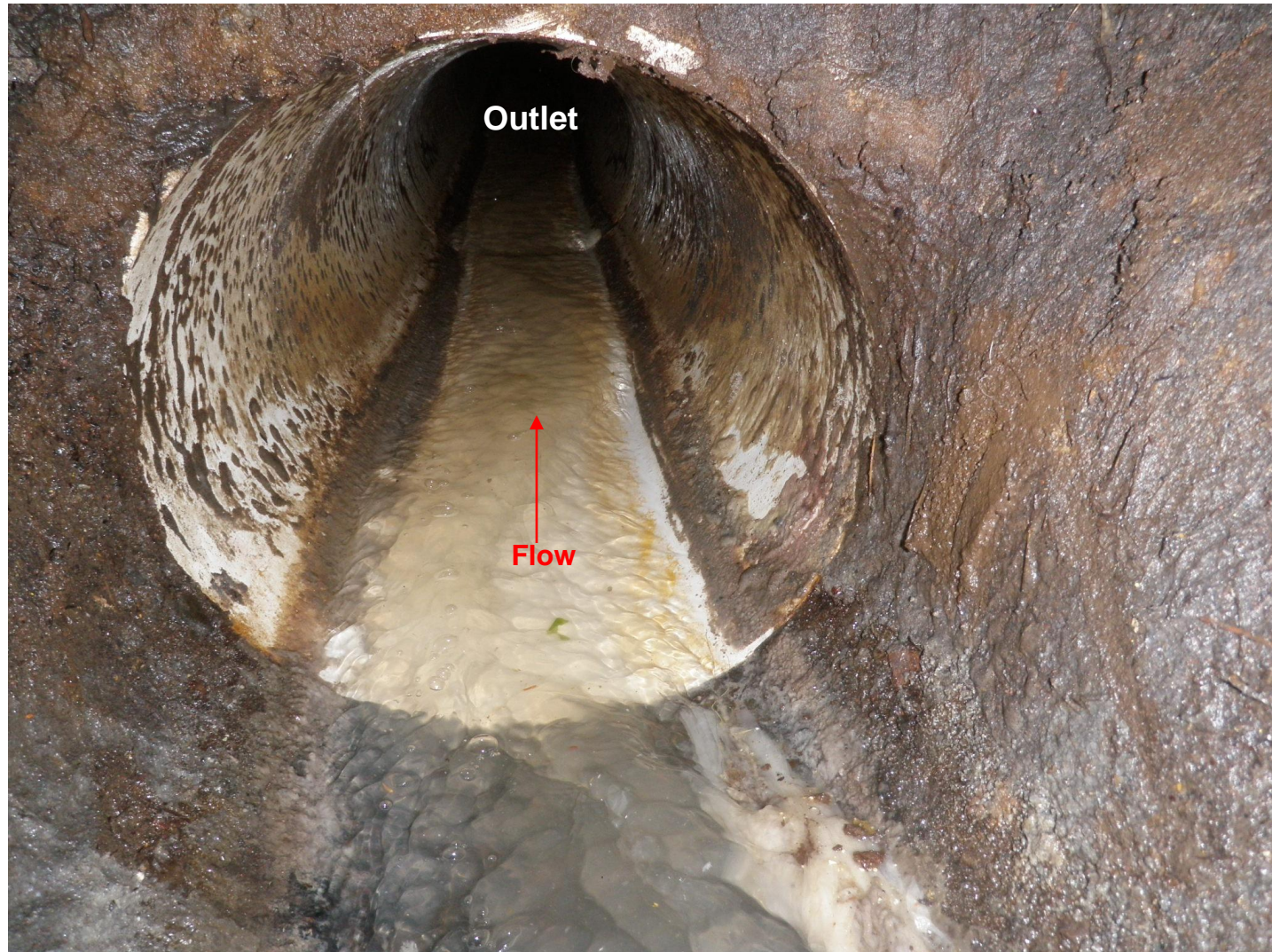
View of sensor placement and site hydraulics



Bend\_0009287

Site outlet

**ADS** ENVIRONMENTAL  
SERVICES®



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_009287

## Flow Monitor

Bend\_009287

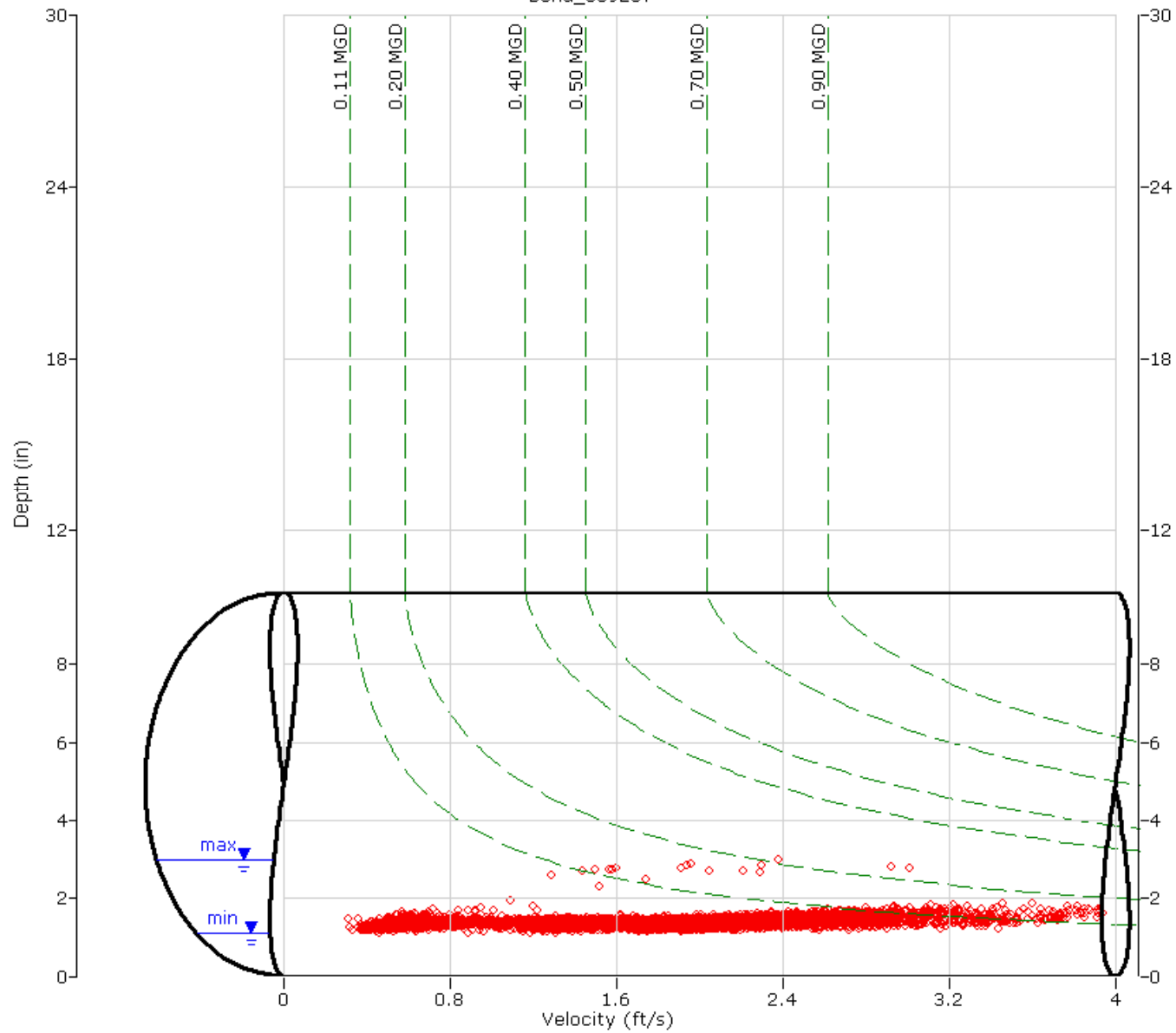
Pipe Height  
9.88 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_009287

## Flow Monitor

Bend\_009287

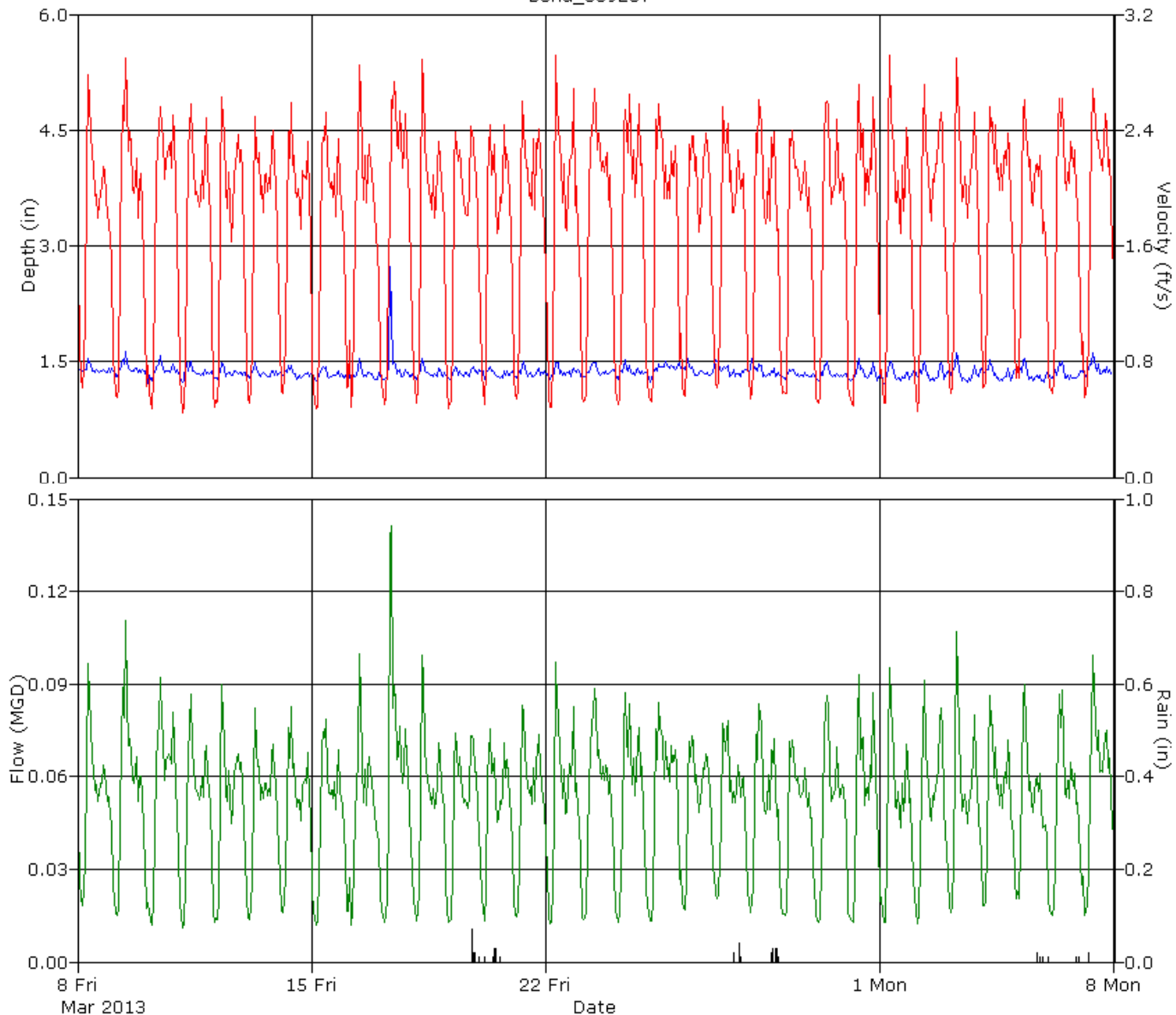
Pipe Height  
9.88 in.

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

Bend_009319	
Measured Pipe Height (in)	27
Nominal Pipe Height (in)	27
Silt Level (in)	0.00

### Overview

Monitoring point Bend\_009319 was located in the West of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a repeatable data set with no unusual hydraulic conditions noted. The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 5%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.64	1.47	0.106
Minimum	0.80	0.22	0.005
Maximum	2.69	2.35	0.299
Time of Minimum	4/6/2013 4:55 AM	3/21/2013 4:35 AM	3/21/2013 4:35 AM
Time of Maximum	3/8/2013 7:35 AM	4/7/2013 10:30 AM	3/25/2013 3:45 PM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_009319		Monitor Series: 5000 AG		Monitor S/N: 20970	
Address/Location: On easement of west side of Al Moody Park off of Daggett Ln.		Manhole #		CMH009319	
		Coordinates:		44° 4'11.15"N 121°16'37.90"W	
		Pipe Height:		27.00"	
Access: Drive		Type of System:		Sanitary <input checked="" type="checkbox"/> Storm <input type="checkbox"/> Combined <input type="checkbox"/>	
		Pipe Width:		27.00"	
		IP Address:		166.219.172.60	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/22/2013 @ 16:22	Manhole Depth:	~ 4'
Site Hydraulics:	Small standing waves	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	Not influenced	Pipe Material / Condition:	Concrete / Good
Upstream Manhole:	Small waves	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input checked="" type="checkbox"/>
Downstream Manhole:	DNI	Telephone Information:	Doesn't apply
Depth of Flow:	1.50" +/- 0.38"	Access Pole #:	Doesn't apply
Range (Air DOF):	25.50" +/- 0.38"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	1.08 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p>Cross Section</p>	<p>Planar</p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_RWRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_009319 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

Site doesn't have any rungs access in and out of manhole must be performed by tripod only

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☒ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 2/28/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 2/28/13



Bend\_009319

Site location

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SERVICES®**



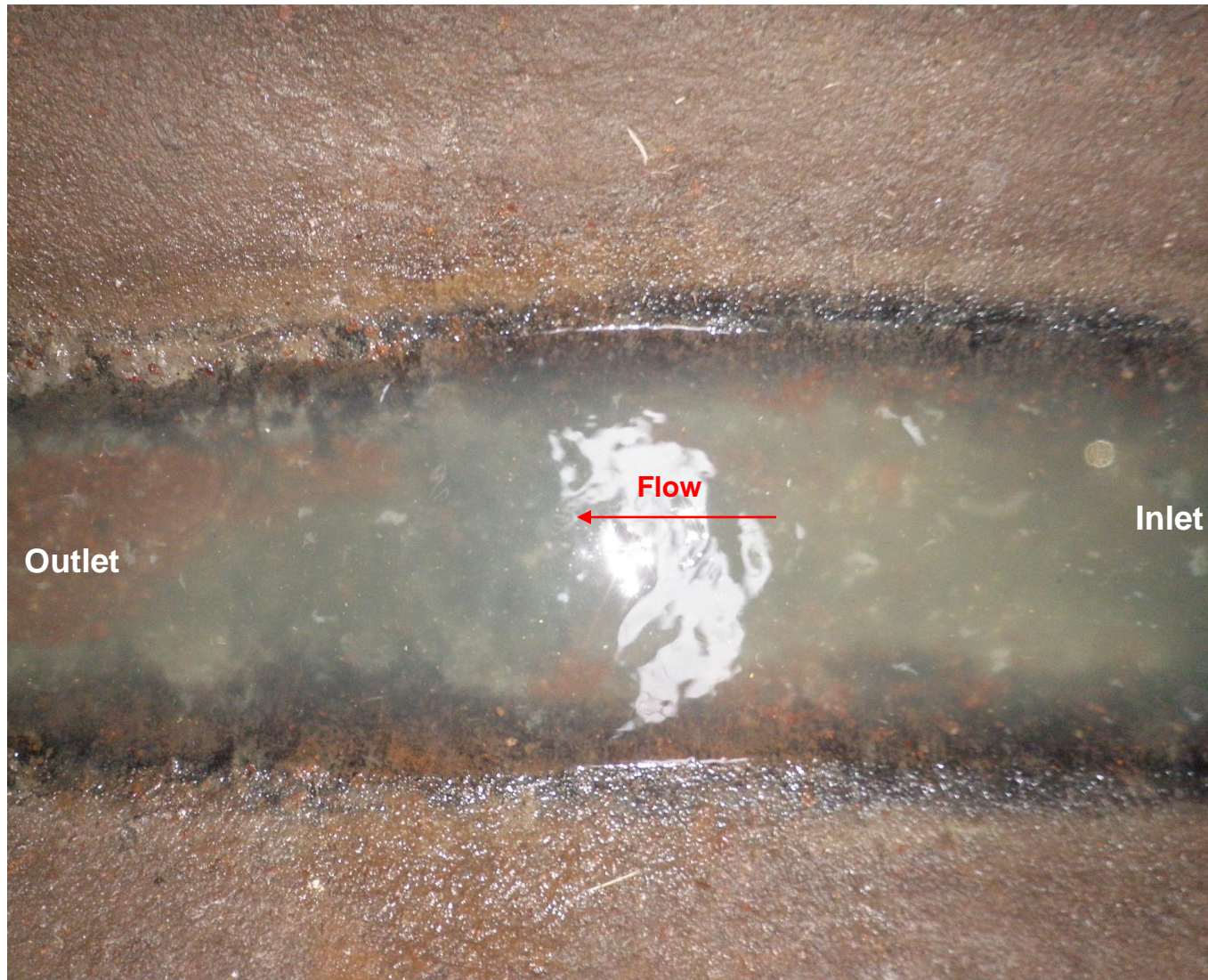
Site access looking north



Bend\_009319

Site set up

**ADS** ENVIRONMENTAL  
SERVICES®



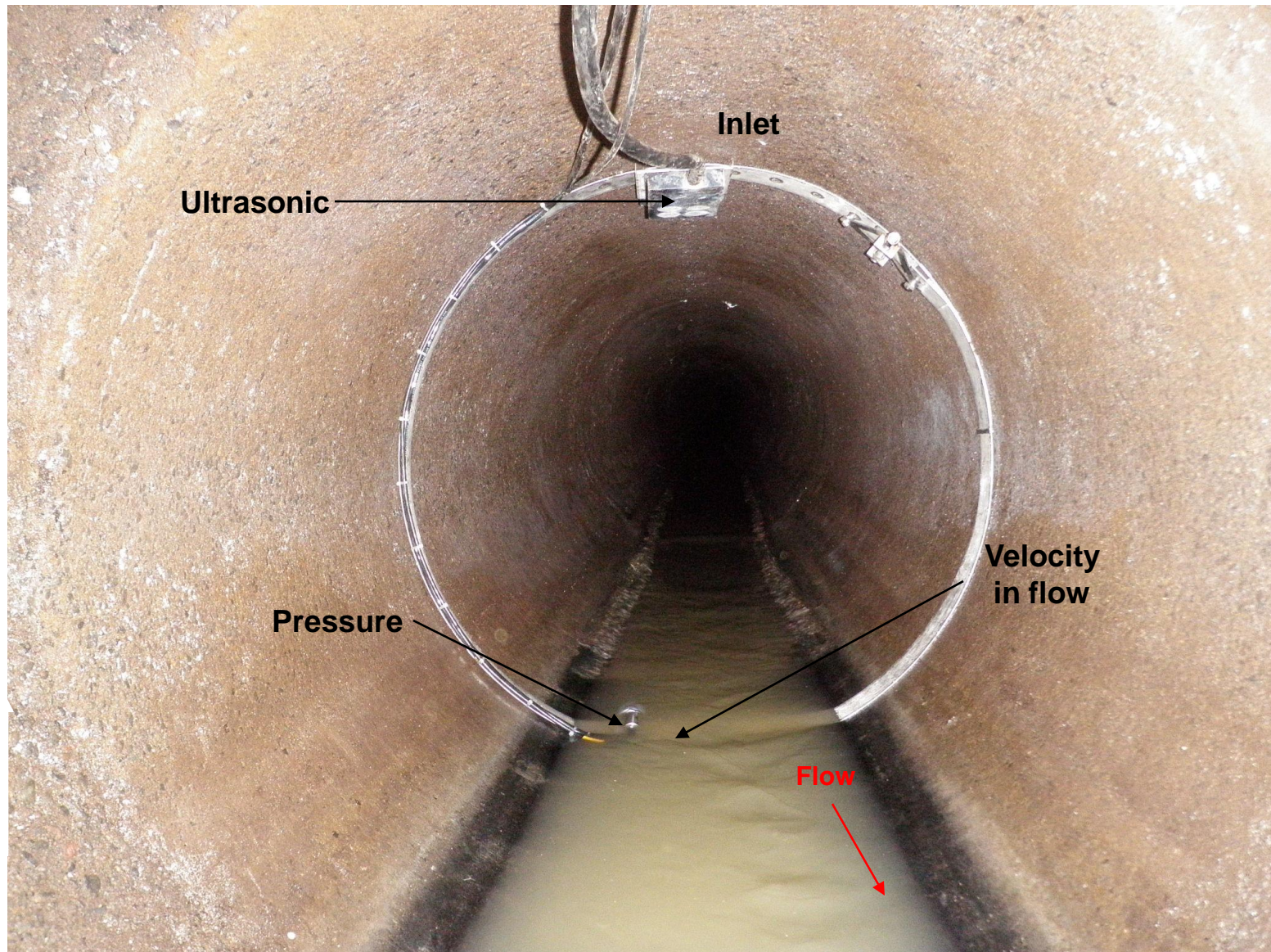
View down manhole facing west



Bend\_009319

Site set up

**ADS ENVIRONMENTAL  
SERVICES®**



View of sensor placement and site hydraulics



Bend\_009319

Site outlet

**ADS ENVIRONMENTAL  
SERVICES®**



View of outlet and hydraulics



# SCATTERGRAPH REPORT

Bend\_009319

## Flow Monitor

Bend\_009319

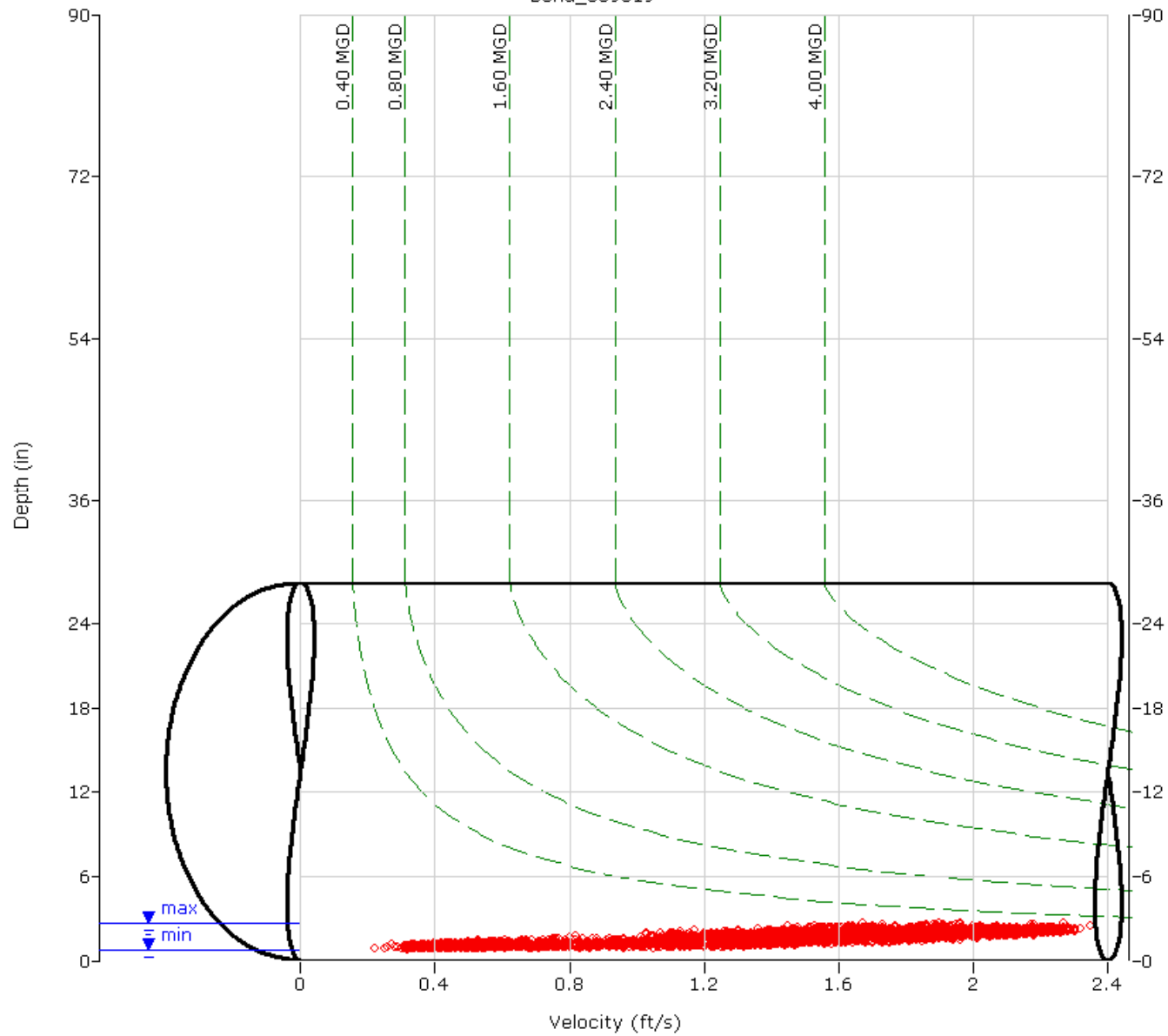
Pipe Height  
27.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

Bend\_009319

## Flow Monitor

Bend\_009319

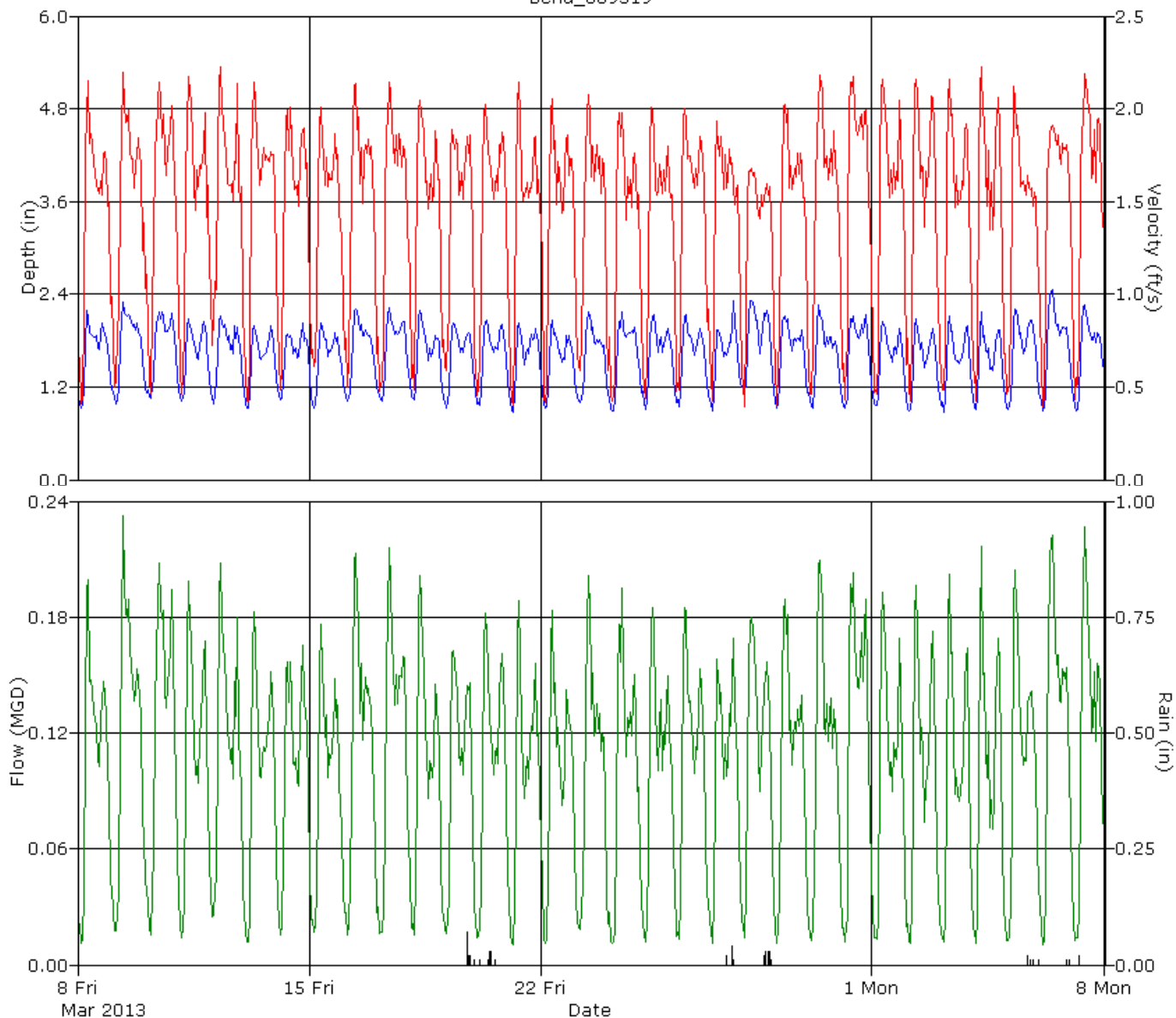
Pipe Height  
27.00 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth
- Velocity
- Quantity
- Rain





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## Site Commentary

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### Site Information

BEND_009686	
Measured Pipe Height (in)	7.88
Nominal Pipe Height (in)	8
Silt Level (in)	0.00

### Overview

Monitoring point BEND\_009686 was located in the Northwest of Bend (see attached site report for details).

The hydrograph indicates a residential diurnal flow pattern with lift station influence during the period Friday, March 08, 2013 to Sunday, April 07, 2013. The scattergraph for this location indicates a fairly repeatable data set however there is some hydraulic shifting present and the peak depth data appear to overstate due to some interference to the downlooking ultrasonic from March 13 - 26, 2013 (these data should be used with caution). The expected (based on a review of the scattergraph and finalization parameters) accuracy at this location is +/- 10%.

The depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

### Observations

The average flow depth, velocity, and quantity data values recorded during Friday, March 08, 2013 to Sunday, April 07, 2013, along with the recorded minimum and maximum data values, are provided in the following table. The minimum and maximum values recorded in the tables are based on a 5-minute sample rate.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.34	1.59	0.162
Minimum	0.82	0.24	0.004
Maximum	6.13	3.08	0.474
Time of Minimum	3/25/2013 3:22 AM	3/24/2013 6:08 AM	3/15/2013 4:30 AM
Time of Maximum	3/13/2013 11:35 AM	3/26/2013 3:34 PM	4/5/2013 7:32 AM

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage. Based upon the quality and consistency of the recorded flow depth and velocity data, the Continuity equation was used to calculate the flow rate.

Percent Uptime (%)	
Depth	100
Velocity	100
Quantity	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend 009686		Monitor Series: 5000 AG		Monitor S/N: 20033	
Address/Location: 63257 Nels Anderson Rd.		Manhole #		CMH009686	
		Coordinates:		44° 5'47.88"N 121°17'52.87"W	
		Pipe Height:		7.88"	
Access: Drive		Type of System:		Pipe Width: 7.88"	
		Sanitary <input checked="" type="checkbox"/>		Storm <input type="checkbox"/>	
		Combined <input type="checkbox"/>		IP Address: 166.219.172.40	



Investigation Information:		Manhole Information:	
Date/Time of Investigation:	2/23/2013 @ 12:12	Manhole Depth:	~ 7'
Site Hydraulics:	Ripples	Manhole Material / Condition	Concrete / Good
Upstream Input: (L/S, P/S)	No influences	Pipe Material / Condition:	PVC / Good
Upstream Manhole:	Ripples, side inlet	Mini System Character:	Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Turbulent	Telephone Information:	Doesn't apply
Depth of Flow:	3.50" +/- 0.25"	Access Pole #:	Doesn't apply
Range (Air DOF):	4.38" +/- 0.25"	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	2.66 fps	Road Cut Length:	Doesn't apply Feet
Silt:	0.00"	Trench Length:	Doesn't apply Feet

Other Information:	
<p><b>Cross Section</b></p>	<p><b>Planar</b></p>

Installation Information	Backup	Yes	No	?	Distance
Installation Type: Standard	Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Ultrasonic, Velocity, Pressure	Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: None observed	WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Bend_JRRG	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
5 PSI pressure used at this location



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12 **Site ID:** Bend\_009686 **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input checked="" type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

No site specific hazards found at this site.

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No site specific hazards found at this site.

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

<input checked="" type="checkbox"/>	This worksite does NOT require a traffic control Plan
<input type="checkbox"/>	Standard Traffic Control Plan is to be used at this work site
<input type="checkbox"/>	This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich  
 Signature: Signed copy can be obtained from ADS  
 Date: 2/23/13

#### Reviewed

Project Mgr Name: Mike Pina  
 Signature: Signed copy can be obtained from ADS  
 Date: 2/23/13



Bend\_009686

Site location

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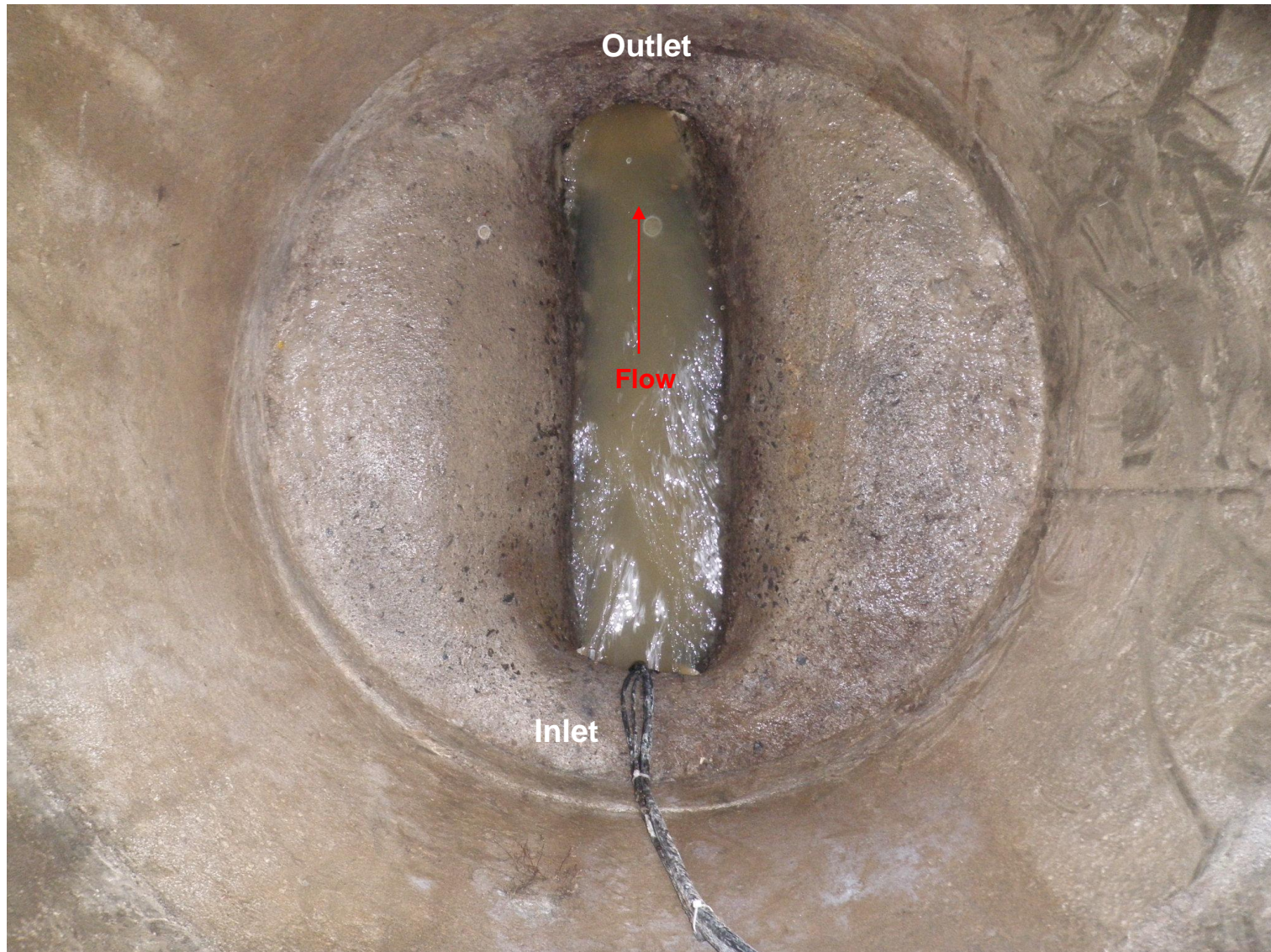
Site access looking north



Bend\_009686

Site set up

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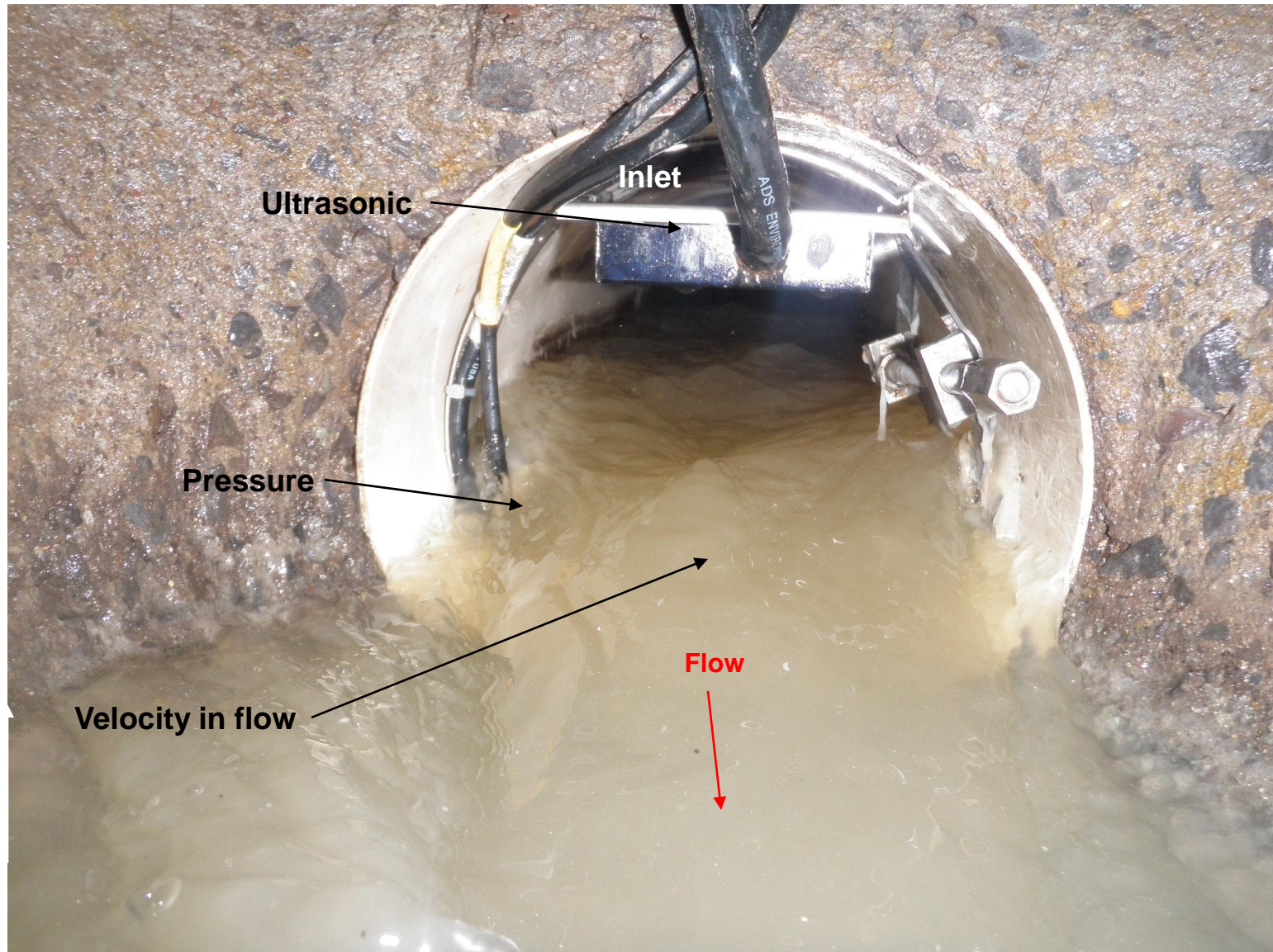
View down manhole facing north



Bend\_009686

Site set up

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SERVICES®**



View of sensor placement and site hydraulics



Bend\_009868

Site outlet

**ADS ENVIRONMENTAL  
SERVICES®**



**View of outlet and hydraulics**



# SCATTERGRAPH REPORT

BEND\_009686

## Flow Monitor

BEND\_009686

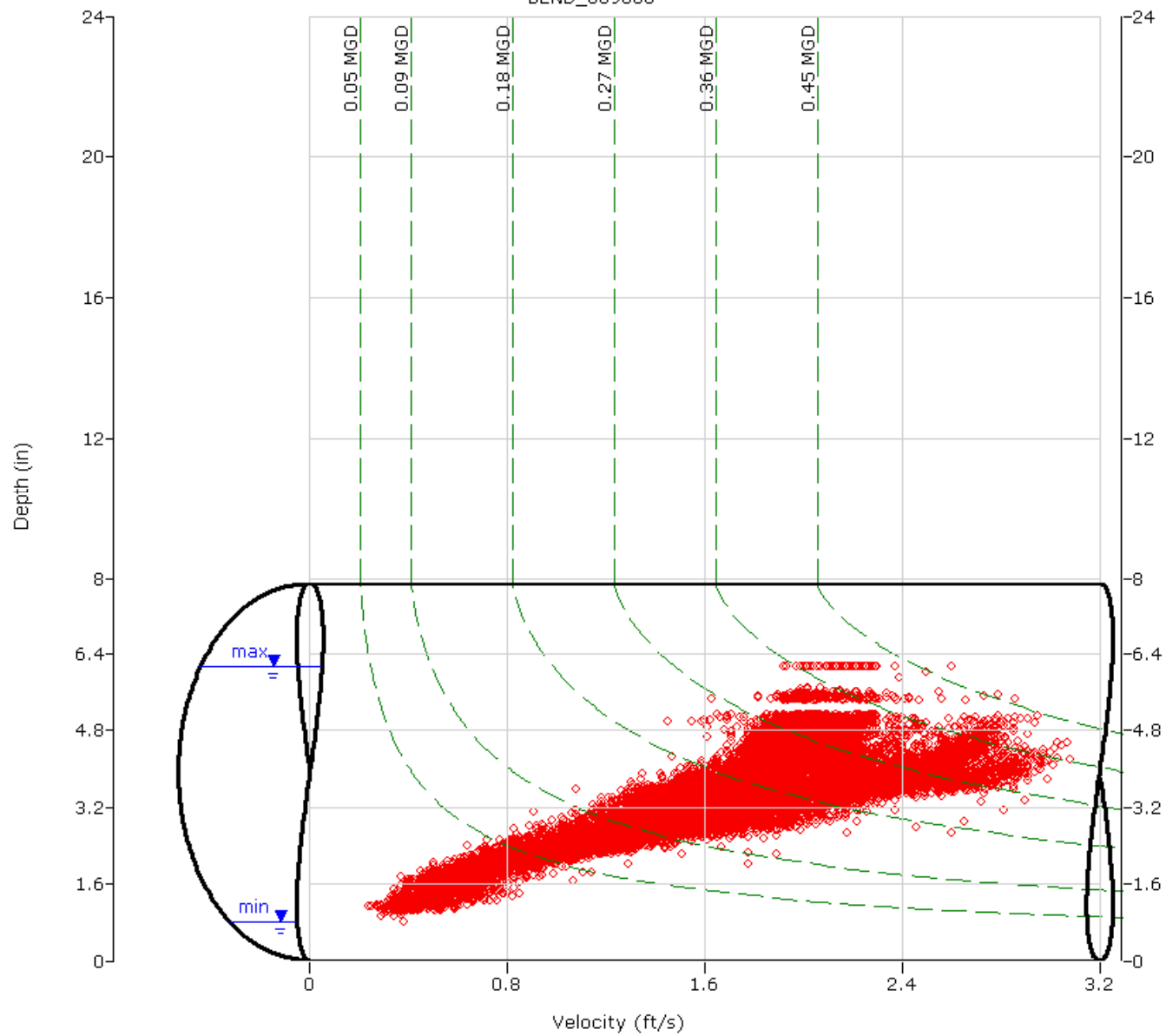
Pipe Height  
7.88 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth





# HYDROGRAPH REPORT

BEND\_009686

## Flow Monitor

BEND\_009686

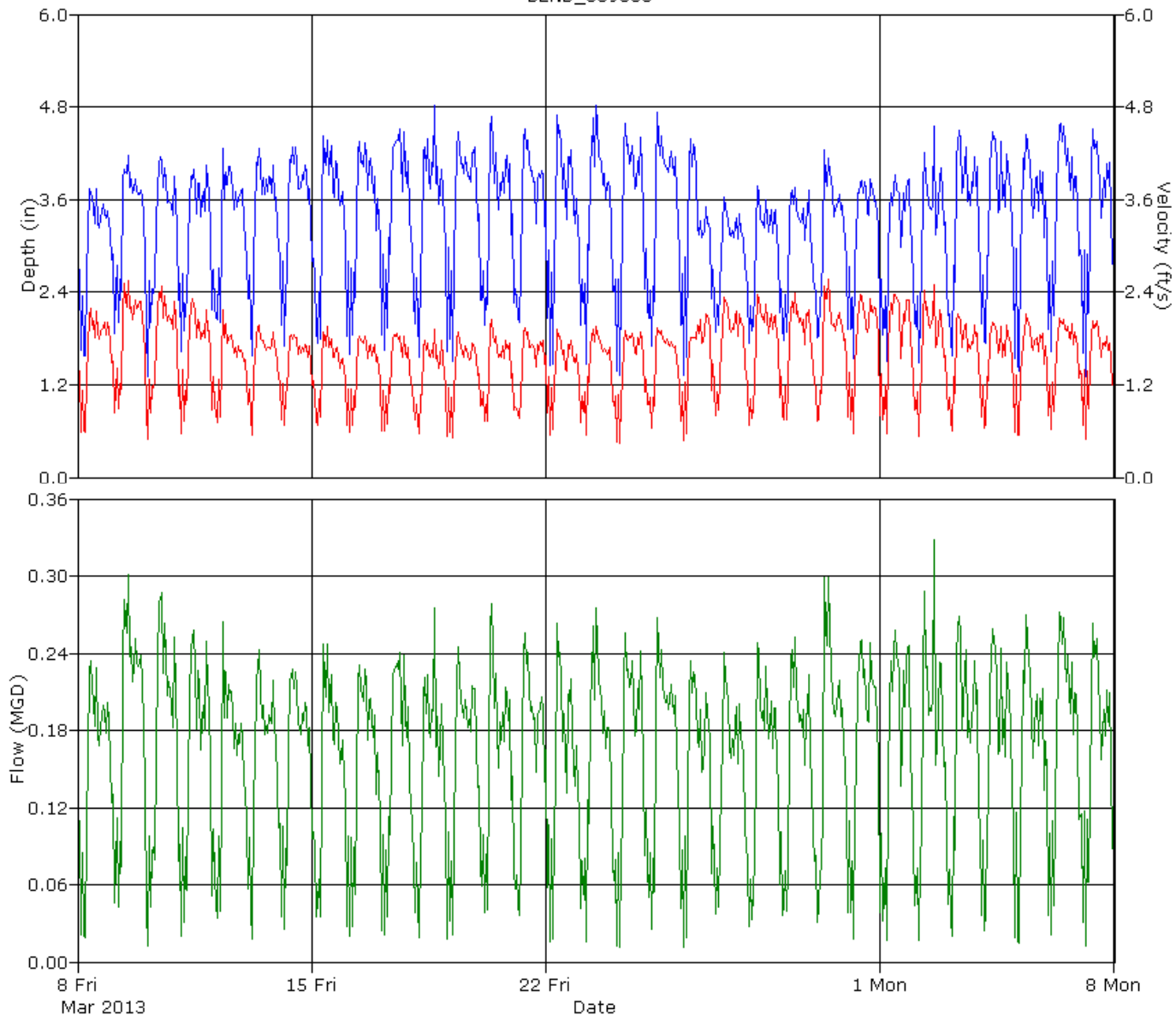
Pipe Height  
7.88 in

## Report Period

3/8/2013  
To  
4/8/2013

## Legend

— Depth  
— Velocity  
— Quantity





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## Site Commentary

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### Site Information

JRRG
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### Overview

Rain gauge JRRG was located in the North of Bend (see attached site report for details).

### Observations

The total rainfall recorded from Friday, March 08, 2013 to Sunday, April 07, 2013 , is provided in the following table. The majority of this rain fell on April 25, 2011.


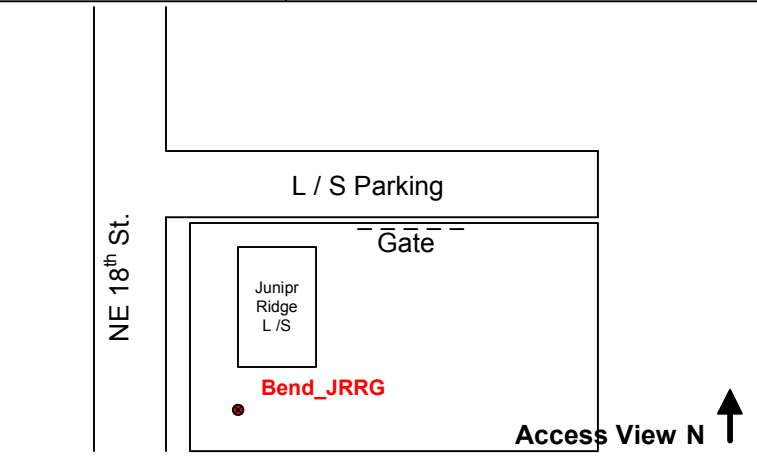
Observed Rainfall	
Item	Rainfall (in)
Total	0.57

### Data Quality

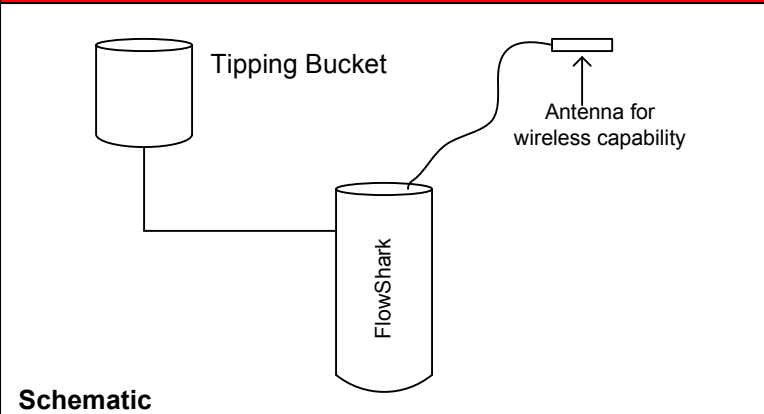

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage.

Percent Uptime (%)	
Rain	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_JRRG		Monitor Series: FS 5000 AG		Monitor S/N: 21006	
Address/Location: North of Cooley Rd. on NE 18 <sup>th</sup> St				Rain Gauge S/N:	
				Thomas Bros Map Page: N / A	
				Pipe Height: N / A	
Access: Drive	Type of System:	Sanitary <input type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 8.00" diameter bucket
					Phone Number: 166.219.172.67
					

Investigation Information:		Manhole Information:	
Activation Date and Time: 3/07/13	Initial Confirmation Date and Time: 3/07/13	Manhole Depth: Doesn't apply	
GPS Lat / Long coordinates:		Manhole Material / Condition: Doesn't apply	
Upstream Input: (L/S, P/S)	Doesn't apply	Pipe Material / Condition: Doesn't apply	
Upstream Manhole:	Doesn't apply	Mini System Character:	Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>
Downstream Manhole:	Doesn't apply	Doesn't apply	
Depth of Flow:	Doesn't apply	Access Pole #:	Doesn't apply
Range (Air DOF):	Doesn't apply	Distance From Manhole:	Doesn't apply Feet
Peak Velocity:	Doesn't apply	Road Cut Length:	Doesn't apply Feet
Silt:	Doesn't apply	Trench Length:	Doesn't apply Feet

Other Information:	
	

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Wireless		Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Tipping bucket		Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: Doesn't apply		WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Guage Zone: North Bend		Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:
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### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12    **Site ID:** Bend\_JRRG    **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
Traffic	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
Confined Space	12	Confined Space does not have useable rungs	<input type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

No Hazards found

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No Site Specific Safety Requirements

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☒ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan TA-18 is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 03/07/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 03/07/13



Bend\_JRRG  
Site Access

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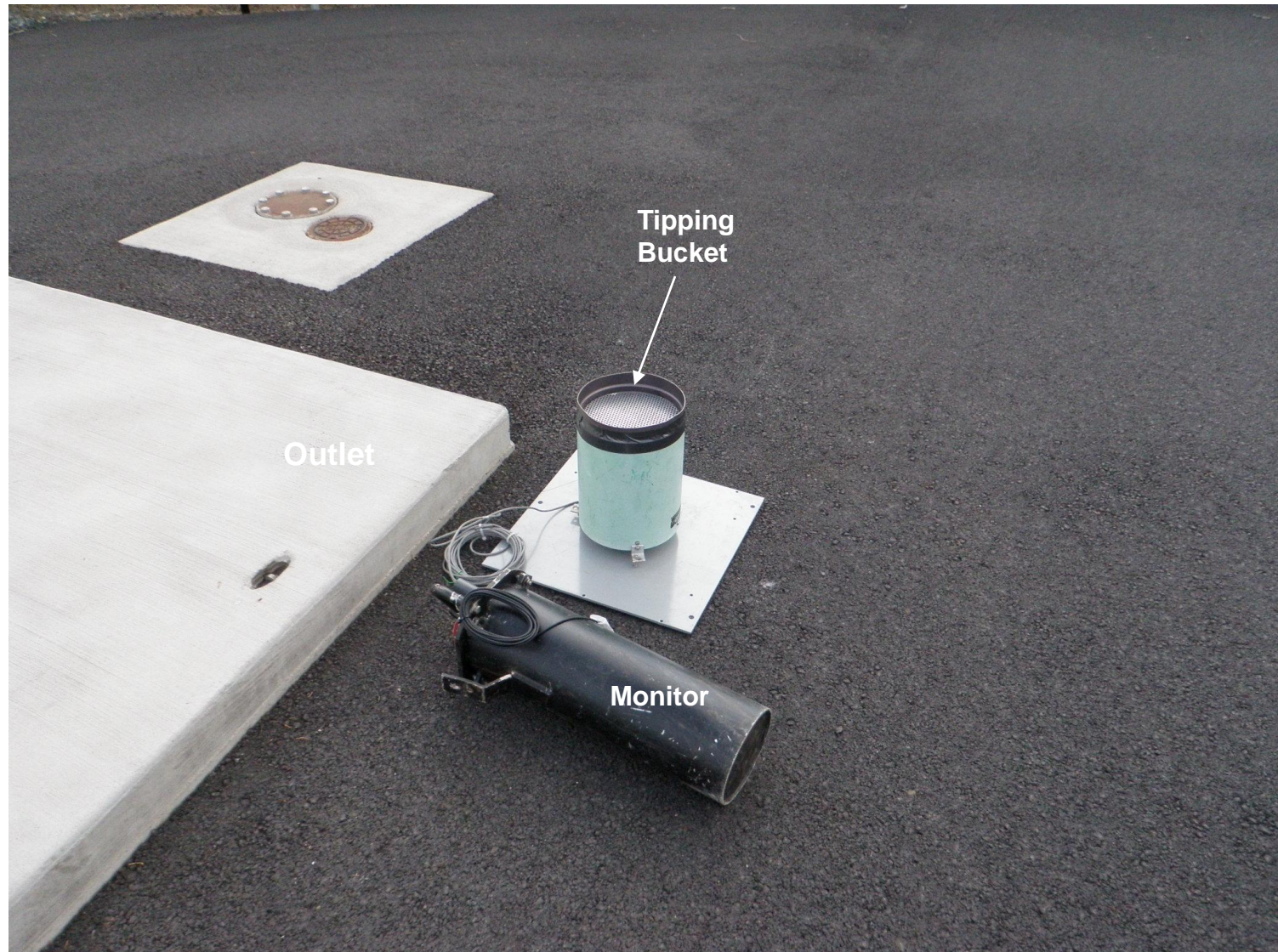
Site Location

Site access looking south



Bend\_JRRG  
Site set up

**ADS** ENVIRONMENTAL  
SERVICES®





# HYDROGRAPH REPORT

JRRG

Flow Monitor

**JRRG**

Pipe Height  
36.00 in.

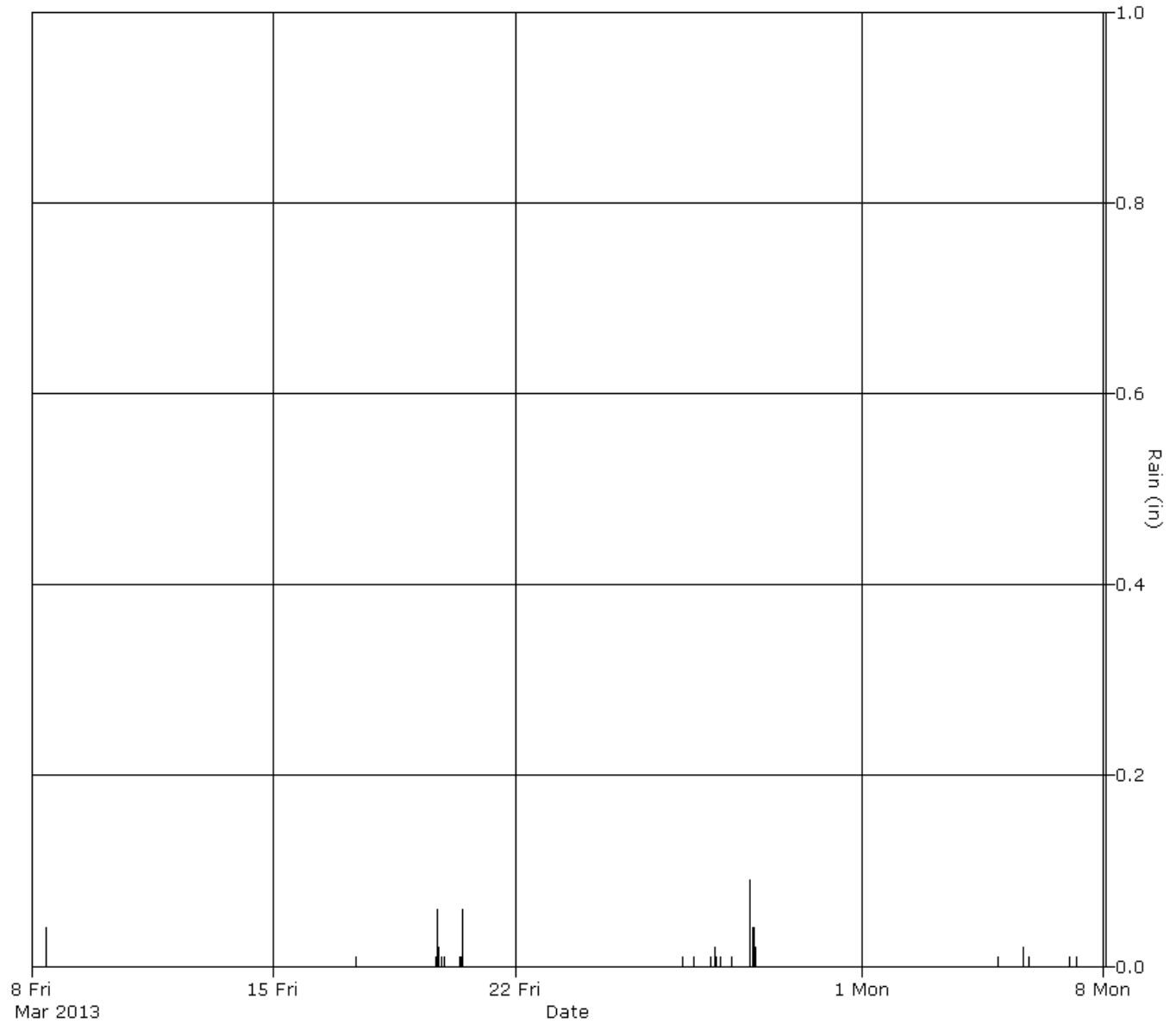
Report Period

3/8/2013  
To  
4/8/2013

Legend

— Rain

**AGS** ENVIRONMENTAL  
SERVICES





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## Site Commentary

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### Site Information

<b>RWRG</b>
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### Overview

Rain gauge RWRG was located in the East of Bend (see attached site report for details). The data for this location was provided to ADS by the MSA.

### Observations

The total rainfall recorded from Friday, March 08, 2013 to Sunday, April 07, 2013, is provided in the following table. The majority of this rain fell on April 25, 2011.

Observed Rainfall	
Item	Rainfall (in)
Total	0.49

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage.

Percent Uptime (%)	
Rain	100



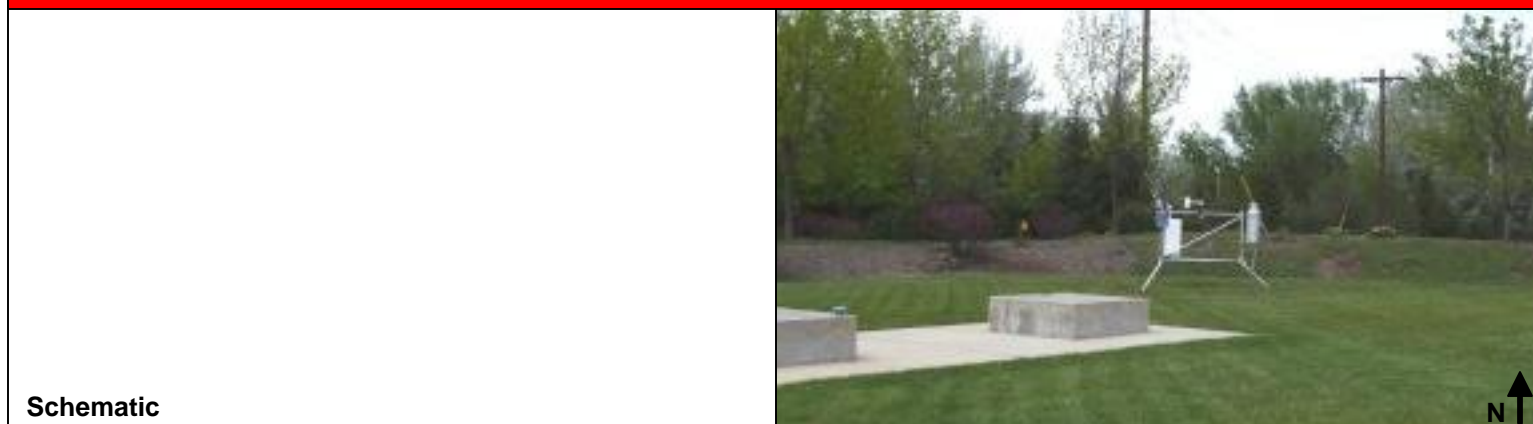
<b>Project Name:</b> Bend Oregon TFM		<b>City / State:</b> Bend, OR		<b>FM Initials:</b> SW	
<b>Site Name:</b> Bend_RWRG		<b>Monitor Series:</b> N/A		<b>Monitor S/N:</b> N/A	
<b>Address/Location:</b> 313 SW Shevlin Hixon Dr (In grass behind Art Station)		<b>Rain Gauge S/N:</b> N/A		<b>Coordinates:</b> 44° 02'51"N 121°19'13"W	
		<b>Pipe Height:</b> N/A			
<b>Access:</b> Drive	<b>Type of System:</b>	<b>Sanitary</b> <input type="checkbox"/>	<b>Storm</b> <input type="checkbox"/>	<b>Combined</b> <input type="checkbox"/>	<b>Pipe Width:</b> N/A
					<b>Phone Number:</b> 166.219.169.178



### Investigation Information: Manhole Information:

<b>Activation Date and Time:</b> N/A		<b>Initial Confirmation Date and Time:</b> N/A		<b>Manhole Depth:</b> N/A	
<b>GPS Lat / Long coordinates:</b>				<b>Manhole Material / Condition:</b> N/A	
<b>Upstream Input: (L/S, P/S)</b>		N/A		<b>Pipe Material / Condition:</b> N/A	
<b>Upstream Manhole:</b>		N/A		<b>Mini System Character:</b> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Trunk <input type="checkbox"/>	
<b>Downstream Manhole:</b>		N/A		<b>Telephone Information:</b> N/A	
<b>Depth of Flow:</b>		N/A		<b>Access Pole #:</b> N/A	
<b>Range (Air DOF):</b>		N/A		<b>Distance From Manhole:</b> N/A Feet	
<b>Peak Velocity:</b>		N/A		<b>Road Cut Length:</b> N/A Feet	
<b>Silt:</b>		N/A		<b>Trench Length:</b> N/A Feet	

### Other Information:



<b>Installation Information</b>		<b>Backup</b>				<b>Yes</b>	<b>No</b>	<b>?</b>	<b>Distance</b>
Installation Type: N/A		Trunk				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Tipping bucket		Lift / Pump Station				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: N/A		WWTP				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Gauge Zone: Central Bend		Other				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

### Additional Site Information / Comments:

This is the "Bend, Oregon AgriMet Station (BEWO)" weather station's rain gauge and tipping bucket (<http://www.usbr.gov/pn/agrimet/agrimetmap/bewoda.html>). Also know as the River Wells weather station.



### Flow Monitoring Site Safety Plan

**Project Name:** Bend Oregon TFM **Site ID:** Bend\_RWRG **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
Traffic	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

No Hazards found

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No Site Specific Safety Requirements

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☒ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan TA-18 is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Sean Winder

Signature: Signed copy can be obtained from ADS

Date: 03/29/11

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 03/29/11



# HYDROGRAPH REPORT

RWRG

Flow Monitor

**RWRG**

Pipe Height  
36.00 in.

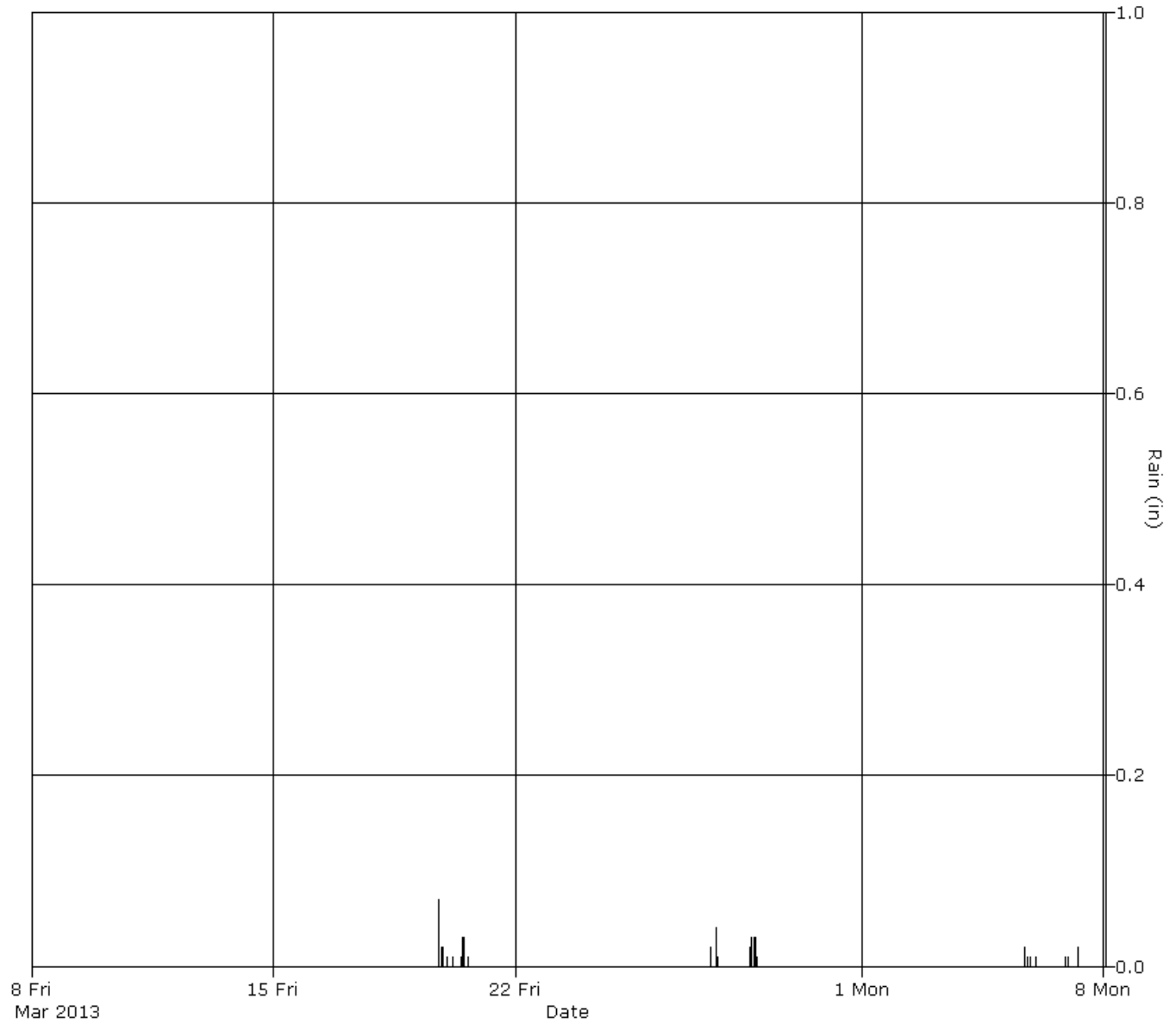
Report Period

3/8/2013  
To  
4/8/2013

Legend

— Rain

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## Site Commentary

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### Site Information

SGRG
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### Overview

Rain gauge SGRG was located in the South of Bend (see attached site report for details).

### Observations

The total rainfall recorded from Friday, March 08, 2013 to Sunday, April 07, 2013 , is provided in the following table. The majority of this rain fell on April 25, 2011.

Observed Rainfall	
Item	Rainfall (in)
Total	0.92

### Data Quality

The data uptime for the Friday, March 08, 2013 to Sunday, April 07, 2013 monitoring period is provided in the table below. Data uptime is defined as the number of 5-minute data points divided by the total number of 5-minute data points available for the monitoring period and provided as a percentage.

Percent Uptime (%)	
Rain	100



Project Name: Bend.TFM.OR.12		City / State: Bend, OR		FM Initials: DS	
Site Name: Bend_SGRG		Monitor Series: FS 5000 AG		Monitor S/N: 21257	
Address/Location: South of Chloe Ln. on SE 15 St.				Rain Gauge S/N:	
				Thomas Bros Map Page: N / A	
				Pipe Height: N / A	
Access: Drive	Type of System:	Sanitary <input type="checkbox"/>	Storm <input type="checkbox"/>	Combined <input type="checkbox"/>	Pipe Width: 8.00" diameter bucket
					Phone Number: 166.219.172..68



Investigation Information:			Manhole Information:		
Activation Date and Time: 3/07/13	Initial Confirmation Date and Time: 3/07/13	Manhole Depth: Doesn't apply			
GPS Lat / Long coordinates: 44°01'16.48" N° 121 02'02.82" W		Manhole Material / Condition: Doesn't apply			
Upstream Input: (L/S, P/S)	Doesn't apply	Pipe Material / Condition: Doesn't apply			
Upstream Manhole:	Doesn't apply	Mini System Character:	Residential <input type="checkbox"/>	Commercial <input type="checkbox"/>	Industrial <input type="checkbox"/>
Downstream Manhole:	Doesn't apply		Trunk <input type="checkbox"/>		
Depth of Flow:	Doesn't apply	Access Pole #:	Doesn't apply		
Range (Air DOF):	Doesn't apply	Distance From Manhole:	Doesn't apply Feet		
Peak Velocity:	Doesn't apply	Road Cut Length:	Doesn't apply Feet		
Silt:	Doesn't apply	Trench Length:	Doesn't apply Feet		

Other Information:	
<p>Schematic</p>	<p style="text-align: right;">N ↓</p>

Installation Information		Backup	Yes	No	?	Distance
Installation Type: Wireless		Trunk	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Sensors Devices: Tipping bucket		Lift / Pump Station	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surcharge Height: Doesn't apply		WWTP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rain Guage Zone: North Bend		Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Site Information / Comments:



### Flow Monitoring Site Safety Plan

**Project Name:** Bend.TFM.OR.12    **Site ID:** Bend\_SGRG    **Site Classification:** (see below)

Note: Class 5 Site Safety Plans must be approved by the Corporate Safety Manager

**\* Hazards found at this site (Discuss checked items below)**

Type	#	Special Hazard	
Communications	1	The site is in a communications "Dead-Zone"	<input type="checkbox"/>
	2	The site is located in or adjacent to an intersection	<input type="checkbox"/>
Traffic	3	The site is located on hill, curve, or where motorists visibility of the site or other vehicles is reduced	<input type="checkbox"/>
	4	The site is located in a high speed (>45MPH) or high density roadway	<input type="checkbox"/>
	5	Site traffic is congested at peak hours	<input type="checkbox"/>
Access	6	Site has access obstacles (rough terrain, fences, deep easement, etc.)	<input type="checkbox"/>
Worksite	7	Worksite contains hazards (terrain, slope, obstructions, etc.)	<input type="checkbox"/>
	8	Elevated work requiring a ladder / work near an unguarded edge. Raised manhole (indicate height below)	<input type="checkbox"/>
	9	Pedestrian control necessary as the site is located in or near a walkway, school, playground, etc.	<input type="checkbox"/>
	10	Work may be performed during darkness; requiring additional site lighting	<input type="checkbox"/>
Confined Space	11	Site is located in a high crime area (check with client & local authorities if unsure)	<input type="checkbox"/>
	12	Confined Space does not have useable rungs	<input type="checkbox"/>
	13	Confined Space depth is greater than 50 feet	<input type="checkbox"/>
	14	Confined Space has internal platforms, weirs or other obstructions that interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	15	Work requires lateral movement that would interfere with or prevent unobstructed vertical retrieval	<input type="checkbox"/>
	16	Flow is hazardous due to depth, velocity, pipe diameter, or is industrial process flow	<input type="checkbox"/>
	17	Confined Space subject to surcharge during / after a rain event	<input type="checkbox"/>
	18	CO, H2S, low O2 or other toxic / flammable gases present or anticipated	<input type="checkbox"/>
	19	Confined Space has active drop connections	<input type="checkbox"/>

**\* Hazards found at this site (Discuss checked items below)**

No Hazards found

**\* Site Classification**

	Class	Description
<input checked="" type="checkbox"/>	1	2-person crew. Standard procedures and equipment. No special requirements
<input type="checkbox"/>	2	Worksite (non-traffic) with access obstacles and or worksite hazards
<input type="checkbox"/>	3	Traffic site requiring special scheduling, additional personnel and / or traffic control equipment, or outsourcing
<input type="checkbox"/>	4	Confined Space Entry requiring special scheduling, additional personnel and / or safety equipment
<input type="checkbox"/>	5	Special Operation requiring a separate safety plan. <i>Must be approved by Corporate Safety Manager</i>

**\* Site Specific Safety Requirements. Must Complete for any site Class 2 & Above**

No Site Specific Safety Requirements

#### Traffic Control Plan

Note: All worksites located in a roadway or immediately adjacent to a roadway, where the operation may impede the normal flow of traffic, are required to have a Traffic Control Plan. Standard Traffic Control Plans are to be carried in the vehicle and referred to when setting up the worksite. Special Traffic Control Plans are to be developed when required by clients or regulating agencies or when a standard Traffic Control Plan is not sufficient to control traffic at the worksite.

- ☒ This worksite does NOT require a traffic control Plan
- ☐ Standard Traffic Control Plan TA-18 is to be used at this work site
- ☐ This site requires a special Traffic Control Plan which is attached

#### Approved

Field Mgr Name: Daniel Sinkovich

Signature: Signed copy can be obtained from ADS

Date: 03/07/13

#### Reviewed

Project Mgr Name: Mike Pina

Signature: Signed copy can be obtained from ADS

Date: 03/07/13



Bend\_SGRG  
Site Access

**ADS** ENVIRONMENTAL  
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Site access looking south



Bend\_SGRG  
Site set up

**ADS** ENVIRONMENTAL  
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# HYDROGRAPH REPORT

SGRG

Flow Monitor

**SGRG**

Pipe Height  
36.00 in.

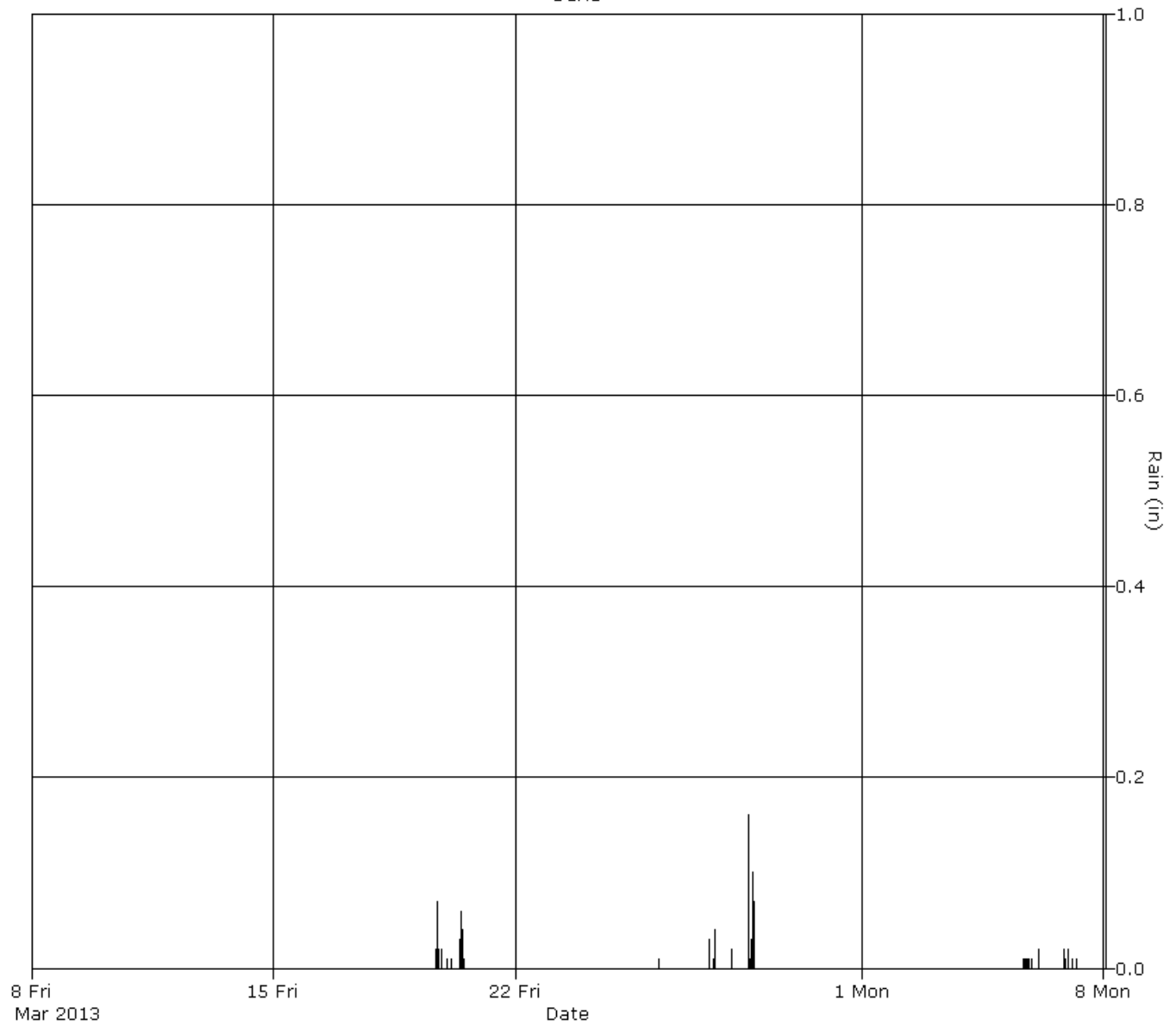
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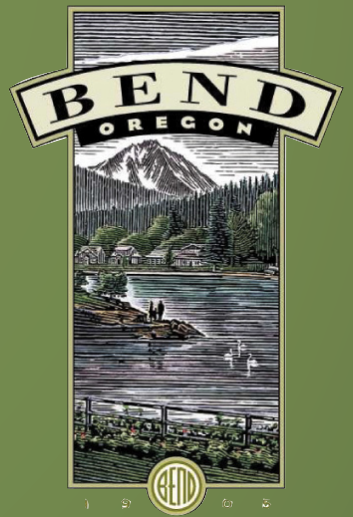
Legend

— Rain

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# MSA

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