



LABORATORY ANALYTICAL REPORT

**Client:** Marathon Ashland Pipeline  
**Project:** PDC AMPP  
**Lab ID:** B08060403-001  
**Client Sample ID:** PD, 0-2 Inches

**Report Date:** 07/24/08  
**Collection Date:** 06/03/08 09:00  
**Date Received:** 06/04/08  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL CHARACTERISTICS</b>							
Sand	21	%		1		ASA15-5	06/17/08 14:50 / srm
Silt	49	%		1		ASA15-5	06/17/08 14:50 / srm
Clay	30	%		1		ASA15-5	06/17/08 14:50 / srm
Texture	CL					ASA15-5	06/17/08 14:50 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
<b>SATURATED PASTE</b>							
pH, sat. paste	7.00	s.u.		0.10		ASAM10-3.2	06/17/08 14:50 / srm
Conductivity, sat. paste	0.58	mmhos/cm		0.01		ASA10-3	06/18/08 14:43 / srm
Saturation	69.6	%		0.1		USDA27a	06/18/08 14:43 / srm
Calcium, sat. paste	3.22	meq/L		0.05		SW6010B	06/19/08 10:38 / rlh
Magnesium, sat. paste	2.15	meq/L		0.08		SW6010B	06/19/08 10:38 / rlh
Sodium, sat. paste	0.28	meq/L		0.04		SW6010B	06/19/08 10:38 / rlh
Sodium Adsorption Ratio (SAR)	0.17	unitless		0.01		Calculation	06/19/08 14:47 / srm
<b>CHEMICAL CHARACTERISTICS</b>							
Lime as CaCO3	1.1	%		0.1		USDA23c	06/17/08 14:50 / srm
<b>EXCHANGEABLES</b>							
Cation Exchange Capacity	40.0	meq/100g	D	0.08		SW6010B	06/12/08 17:02 / rlh
Exchangeable Sodium Percentage	0.14	%		0.01		USDA20a	06/19/08 14:47 / srm
<b>METALS, AMMONIUM ACETATE EXTRACTABLE</b>							
Sodium, extractable	0.076	meq/100g	D	0.00039		SW6010B	06/11/08 00:42 / rlh

**Report Definitions:**

RL - Analyte reporting limit.  
 QCL - Quality control limit.  
 D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.  
 ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

**Client:** Marathon Ashland Pipeline  
**Project:** PDC AMPP  
**Lab ID:** B08060403-002  
**Client Sample ID:** PD, 0-6 Inches

**Report Date:** 07/24/08  
**Collection Date:** 06/03/08 09:00  
**Date Received:** 06/04/08  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL CHARACTERISTICS</b>							
Sand	22	%		1		ASA15-5	06/17/08 14:50 / srm
Silt	50	%		1		ASA15-5	06/17/08 14:50 / srm
Clay	28	%		1		ASA15-5	06/17/08 14:50 / srm
Texture	CL					ASA15-5	06/17/08 14:50 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
<b>SATURATED PASTE</b>							
pH, sat. paste	7.20	s.u.		0.10		ASAM10-3.2	06/17/08 14:50 / srm
Conductivity, sat. paste	0.61	mmhos/cm		0.01		ASA10-3	06/18/08 14:43 / srm
Saturation	63.6	%		0.1		USDA27a	06/18/08 14:43 / srm
Calcium, sat. paste	3.77	meq/L		0.05		SW6010B	06/19/08 10:45 / rlh
Magnesium, sat. paste	2.47	meq/L		0.08		SW6010B	06/19/08 10:45 / rlh
Sodium, sat. paste	0.46	meq/L		0.04		SW6010B	06/19/08 10:45 / rlh
Sodium Adsorption Ratio (SAR)	0.26	unitless		0.01		Calculation	06/19/08 14:47 / srm
Sulfate	1.53	meq/L		0.02		ASA10-3	06/18/08 13:47 / qed
<b>CHEMICAL CHARACTERISTICS</b>							
Lime as CaCO3	23.3	%		0.1		USDA23c	06/17/08 14:50 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	06/13/08 13:11 / srm
Nitrate as N, KCL Extract	4	mg/kg		1		ASA33-8	06/13/08 14:56 / srm
Organic Matter	4.62	%		0.02		ASA29-3	06/13/08 14:25 / srm
<b>EXCHANGEABLES</b>							
Cation Exchange Capacity	37.9	meq/100g	D	0.08		SW6010B	06/12/08 17:09 / rlh
Exchangeable Sodium Percentage	0.21	%		0.01		USDA20a	06/19/08 14:47 / srm
<b>METALS, AMMONIUM ACETATE EXTRACTABLE</b>							
Sodium, extractable	0.11	meq/100g	D	0.00039		SW6010B	06/11/08 00:49 / rlh
Potassium, available	256	mg/kg	D	0.13		SW6010B	06/11/08 00:49 / rlh
<b>METALS, DTPA EXTRACTABLE</b>							
Zinc	1.1	mg/kg		0.1		SW6010B	06/13/08 21:29 / rlh

**Report Definitions:**

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MCL - Maximum contaminant level.  
 ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

**Client:** Marathon Ashland Pipeline  
**Project:** PDC AMPP  
**Lab ID:** B08060403-003  
**Client Sample ID:** PD, 6-12 Inches

**Report Date:** 07/24/08  
**Collection Date:** 06/03/08 09:00  
**Date Received:** 06/04/08  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL CHARACTERISTICS</b>							
Sand	24	%		1		ASA15-5	06/17/08 14:50 / srm
Silt	48	%		1		ASA15-5	06/17/08 14:50 / srm
Clay	28	%		1		ASA15-5	06/17/08 14:50 / srm
Texture	CL					ASA15-5	06/17/08 14:50 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
<b>SATURATED PASTE</b>							
pH, sat. paste	7.20	s.u.		0.10		ASAM10-3.2	06/17/08 14:50 / srm
Conductivity, sat. paste	0.46	mmhos/cm		0.01		ASA10-3	06/18/08 14:43 / srm
Saturation	61.7	%		0.1		USDA27a	06/18/08 14:43 / srm
Calcium, sat. paste	2.40	meq/L		0.05		SW6010B	06/19/08 12:22 / rlh
Magnesium, sat. paste	1.75	meq/L		0.08		SW6010B	06/19/08 12:22 / rlh
Sodium, sat. paste	0.67	meq/L		0.04		SW6010B	06/19/08 12:22 / rlh
Sodium Adsorption Ratio (SAR)	0.47	unitless		0.01		Calculation	06/19/08 14:47 / srm
Sulfate	1.22	meq/L		0.02		ASA10-3	06/18/08 14:21 / qed
<b>CHEMICAL CHARACTERISTICS</b>							
Lime as CaCO3	1.1	%		0.1		USDA23c	06/17/08 14:50 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8	06/13/08 14:58 / srm
<b>EXCHANGEABLES</b>							
Cation Exchange Capacity	35.3	meq/100g	D	0.08		SW6010B	06/12/08 17:48 / rlh
Exchangeable Sodium Percentage	0.34	%		0.01		USDA20a	06/19/08 14:47 / srm
<b>METALS, AMMONIUM ACETATE EXTRACTABLE</b>							
Sodium, extractable	0.16	meq/100g	D	0.00039		SW6010B	06/11/08 01:04 / rlh

**Report Definitions:**

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MCL - Maximum contaminant level.  
 ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

**Client:** Marathon Ashland Pipeline  
**Project:** PDC AMPP  
**Lab ID:** B08060403-004  
**Client Sample ID:** PD, 12-24 Inches

**Report Date:** 07/24/08  
**Collection Date:** 06/03/08 09:00  
**Date Received:** 06/04/08  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL CHARACTERISTICS</b>							
Sand	15	%		1		ASA15-5	06/17/08 14:50 / srm
Silt	47	%		1		ASA15-5	06/17/08 14:50 / srm
Clay	38	%		1		ASA15-5	06/17/08 14:50 / srm
Texture	SiCL					ASA15-5	06/17/08 14:50 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
<b>SATURATED PASTE</b>							
pH, sat. paste	7.60	s.u.		0.10		ASAM10-3.2	06/17/08 14:50 / srm
Conductivity, sat. paste	0.72	mmhos/cm		0.01		ASA10-3	06/18/08 14:43 / srm
Saturation	65.1	%		0.1		USDA27a	06/18/08 14:43 / srm
Calcium, sat. paste	3.56	meq/L		0.05		SW6010B	06/19/08 12:26 / rlh
Magnesium, sat. paste	3.02	meq/L		0.08		SW6010B	06/19/08 12:26 / rlh
Sodium, sat. paste	1.02	meq/L		0.04		SW6010B	06/19/08 12:26 / rlh
Sodium Adsorption Ratio (SAR)	0.56	unitless		0.01		Calculation	06/19/08 14:47 / srm
Sulfate	4.00	meq/L		0.02		ASA10-3	06/18/08 14:33 / qed
<b>CHEMICAL CHARACTERISTICS</b>							
Lime as CaCO3	2.7	%		0.1		USDA23c	06/17/08 14:50 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8	06/13/08 15:00 / srm
<b>EXCHANGEABLES</b>							
Cation Exchange Capacity	34.9	meq/100g	D	0.08		SW6010B	06/12/08 17:52 / rlh
Exchangeable Sodium Percentage	0.44	%		0.01		USDA20a	06/19/08 14:47 / srm
<b>METALS, AMMONIUM ACETATE EXTRACTABLE</b>							
Sodium, extractable	0.22	meq/100g	D	0.00039		SW6010B	06/11/08 01:08 / rlh

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LABORATORY ANALYTICAL REPORT

**Client:** Marathon Ashland Pipeline  
**Project:** PDC AMPP  
**Lab ID:** B08060403-005  
**Client Sample ID:** PD, 24-36 Inches

**Report Date:** 07/24/08  
**Collection Date:** 06/03/08 09:00  
**Date Received:** 06/04/08  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL CHARACTERISTICS</b>							
Sand	16	%		1		ASA15-5	06/17/08 14:50 / srm
Silt	47	%		1		ASA15-5	06/17/08 14:50 / srm
Clay	37	%		1		ASA15-5	06/17/08 14:50 / srm
Texture	SiCL					ASA15-5	06/17/08 14:50 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
<b>SATURATED PASTE</b>							
pH, sat. paste	7.80	s.u.		0.10		ASAM10-3.2	06/17/08 14:50 / srm
Conductivity, sat. paste	1.58	mmhos/cm		0.01		ASA10-3	06/18/08 14:43 / srm
Saturation	49.9	%		0.1		USDA27a	06/18/08 14:43 / srm
Calcium, sat. paste	10.1	meq/L		0.05		SW6010B	06/19/08 12:30 / rlh
Magnesium, sat. paste	8.03	meq/L		0.08		SW6010B	06/19/08 12:30 / rlh
Sodium, sat. paste	1.62	meq/L		0.04		SW6010B	06/19/08 12:30 / rlh
Sodium Adsorption Ratio (SAR)	0.54	unitless		0.01		Calculation	06/19/08 14:47 / srm
<b>CHEMICAL CHARACTERISTICS</b>							
Lime as CaCO3	7.3	%		0.1		USDA23c	06/17/08 14:50 / srm
<b>EXCHANGEABLES</b>							
Cation Exchange Capacity	29.7	meq/100g	D	0.08		SW6010B	06/12/08 17:56 / rlh
Exchangeable Sodium Percentage	0.47	%		0.01		USDA20a	06/19/08 14:47 / srm
<b>METALS, AMMONIUM ACETATE EXTRACTABLE</b>							
Sodium, extractable	0.22	meq/100g	D	0.00039		SW6010B	06/11/08 01:12 / rlh

**Report Definitions:**

RL - Analyte reporting limit.  
 QCL - Quality control limit.  
 D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.  
 ND - Not detected at the reporting limit.



**LABORATORY ANALYTICAL REPORT**

**Client:** Marathon Ashland Pipeline  
**Project:** PDC AMPP  
**Lab ID:** B08060403-006  
**Client Sample ID:** PD, 36-48 Inches

**Report Date:** 07/24/08  
**Collection Date:** 06/03/08 09:00  
**Date Received:** 06/04/08  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL CHARACTERISTICS</b>							
Sand	17	%		1		ASA15-5	06/17/08 14:50 / srm
Silt	46	%		1		ASA15-5	06/17/08 14:50 / srm
Clay	37	%		1		ASA15-5	06/17/08 14:50 / srm
Texture	SiCL					ASA15-5	06/17/08 14:50 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
<b>SATURATED PASTE</b>							
pH, sat. paste	7.60	s.u.		0.10		ASAM10-3.2	06/17/08 14:50 / srm
Conductivity, sat. paste	3.16	mmhos/cm		0.01		ASA10-3	06/18/08 14:43 / srm
Saturation	50.4	%		0.1		USDA27a	06/18/08 14:43 / srm
Calcium, sat. paste	26.1	meq/L		0.05		SW6010B	06/19/08 12:34 / rlh
Magnesium, sat. paste	19.0	meq/L		0.08		SW6010B	06/19/08 12:34 / rlh
Sodium, sat. paste	2.40	meq/L		0.04		SW6010B	06/19/08 12:34 / rlh
Sodium Adsorption Ratio (SAR)	0.51	unitless		0.01		Calculation	06/19/08 14:47 / srm
<b>CHEMICAL CHARACTERISTICS</b>							
Lime as CaCO3	6.9	%		0.1		USDA23c	06/17/08 14:50 / srm
<b>EXCHANGEABLES</b>							
Cation Exchange Capacity	28.6	meq/100g	D	0.08		SW6010B	06/12/08 17:59 / rlh
Exchangeable Sodium Percentage	0.54	%		0.01		USDA20a	06/19/08 14:47 / srm
<b>METALS, AMMONIUM ACETATE EXTRACTABLE</b>							
Sodium, extractable	0.28	meq/100g	D	0.00039		SW6010B	06/11/08 01:16 / rlh

**Report Definitions:**

RL - Analyte reporting limit.  
 QCL - Quality control limit.  
 D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.  
 ND - Not detected at the reporting limit.



**LABORATORY ANALYTICAL REPORT**

**Client:** Marathon Ashland Pipeline  
**Project:** PDC AMPP  
**Lab ID:** B08060403-007  
**Client Sample ID:** PD, 48-60 Inches

**Report Date:** 07/24/08  
**Collection Date:** 06/03/08 09:00  
**Date Received:** 06/04/08  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL CHARACTERISTICS</b>							
Sand	13	%		1		ASA15-5	06/17/08 14:50 / srm
Silt	47	%		1		ASA15-5	06/17/08 14:50 / srm
Clay	40	%		1		ASA15-5	06/17/08 14:50 / srm
Texture	SiC					ASA15-5	06/17/08 14:50 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
<b>SATURATED PASTE</b>							
pH, sat. paste	7.70	s.u.		0.10		ASAM10-3.2	06/17/08 14:50 / srm
Conductivity, sat. paste	3.06	mmhos/cm		0.01		ASA10-3	06/18/08 14:43 / srm
Saturation	56.0	%		0.1		USDA27a	06/18/08 14:43 / srm
Calcium, sat. paste	28.0	meq/L		0.05		SW6010B	06/19/08 12:41 / rlh
Magnesium, sat. paste	15.0	meq/L		0.08		SW6010B	06/19/08 12:41 / rlh
Sodium, sat. paste	2.00	meq/L		0.04		SW6010B	06/19/08 12:41 / rlh
Sodium Adsorption Ratio (SAR)	0.43	unitless		0.01		Calculation	06/19/08 14:47 / srm
<b>CHEMICAL CHARACTERISTICS</b>							
Lime as CaCO3	8.9	%		0.1		USDA23c	06/17/08 14:50 / srm
<b>EXCHANGEABLES</b>							
Cation Exchange Capacity	27.8	meq/100g	D	0.08		SW6010B	06/12/08 18:03 / rlh
Exchangeable Sodium Percentage	0.45	%		0.01		USDA20a	06/19/08 14:47 / srm
<b>METALS, AMMONIUM ACETATE EXTRACTABLE</b>							
Sodium, extractable	0.24	meq/100g	D	0.00039		SW6010B	06/11/08 01:20 / rlh

**Report Definitions:**

RL - Analyte reporting limit.  
 QCL - Quality control limit.  
 D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.  
 ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

**Client:** Marathon Ashland Pipeline  
**Project:** PDC AMPP  
**Lab ID:** B08060403-008  
**Client Sample ID:** PD, 60-72 Inches

**Report Date:** 07/24/08  
**Collection Date:** 06/03/08 09:00  
**Date Received:** 06/04/08  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL CHARACTERISTICS</b>							
Sand	17	%		1		ASA15-5	06/17/08 14:50 / srm
Silt	46	%		1		ASA15-5	06/17/08 14:50 / srm
Clay	37	%		1		ASA15-5	06/17/08 14:50 / srm
Texture	SiCL					ASA15-5	06/17/08 14:50 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
<b>SATURATED PASTE</b>							
pH, sat. paste	7.70	s.u.		0.10		ASAM10-3.2	06/17/08 14:50 / srm
Conductivity, sat. paste	3.01	mmhos/cm		0.01		ASA10-3	06/18/08 14:43 / srm
Saturation	53.1	%		0.1		USDA27a	06/18/08 14:43 / srm
Calcium, sat. paste	28.1	meq/L		0.05		SW6010B	06/19/08 12:45 / rlh
Magnesium, sat. paste	13.9	meq/L		0.08		SW6010B	06/19/08 12:45 / rlh
Sodium, sat. paste	1.97	meq/L		0.04		SW6010B	06/19/08 12:45 / rlh
Sodium Adsorption Ratio (SAR)	0.43	unitless		0.01		Calculation	06/19/08 14:47 / srm
<b>CHEMICAL CHARACTERISTICS</b>							
Lime as CaCO3	9.1	%		0.1		USDA23c	06/17/08 14:50 / srm
<b>EXCHANGEABLES</b>							
Cation Exchange Capacity	27.2	meq/100g	D	0.08		SW6010B	06/12/08 18:07 / rlh
Exchangeable Sodium Percentage	0.49	%		0.01		USDA20a	06/19/08 14:47 / srm
<b>METALS, AMMONIUM ACETATE EXTRACTABLE</b>							
Sodium, extractable	0.24	meq/100g	D	0.00039		SW6010B	06/11/08 01:23 / rlh

**Report Definitions:**

RL - Analyte reporting limit.  
 QCL - Quality control limit.  
 D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.  
 ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

**Client:** Marathon Ashland Pipeline  
**Project:** PDC AMPP  
**Lab ID:** B08060403-009  
**Client Sample ID:** PD, 72-96 Inches

**Report Date:** 07/24/08  
**Collection Date:** 06/03/08 09:00  
**Date Received:** 06/04/08  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL CHARACTERISTICS</b>							
Sand	25	%		1		ASA15-5	06/17/08 14:50 / srm
Silt	40	%		1		ASA15-5	06/17/08 14:50 / srm
Clay	35	%		1		ASA15-5	06/17/08 14:50 / srm
Texture	CL					ASA15-5	06/17/08 14:50 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
<b>SATURATED PASTE</b>							
pH, sat. paste	7.70	s.u.		0.10		ASAM10-3.2	06/17/08 14:50 / srm
Conductivity, sat. paste	3.23	mmhos/cm		0.01		ASA10-3	06/18/08 14:43 / srm
Saturation	51.0	%		0.1		USDA27a	06/18/08 14:43 / srm
Calcium, sat. paste	28.3	meq/L		0.05		SW6010B	06/19/08 12:49 / rlh
Magnesium, sat. paste	17.7	meq/L		0.08		SW6010B	06/19/08 12:49 / rlh
Sodium, sat. paste	2.51	meq/L		0.04		SW6010B	06/19/08 12:49 / rlh
Sodium Adsorption Ratio (SAR)	0.52	unitless		0.01		Calculation	06/19/08 14:47 / srm
<b>CHEMICAL CHARACTERISTICS</b>							
Lime as CaCO3	6.6	%		0.1		USDA23c	06/17/08 14:50 / srm
<b>EXCHANGEABLES</b>							
Cation Exchange Capacity	25.6	meq/100g	D	0.08		SW6010B	06/12/08 18:11 / rlh
Exchangeable Sodium Percentage	0.48	%		0.01		USDA20a	06/19/08 14:47 / srm
<b>METALS, AMMONIUM ACETATE EXTRACTABLE</b>							
Sodium, extractable	0.25	meq/100g	D	0.00039		SW6010B	06/11/08 01:27 / rlh

**Report Definitions:**

RL - Analyte reporting limit.

QCL - Quality control limit.

D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.