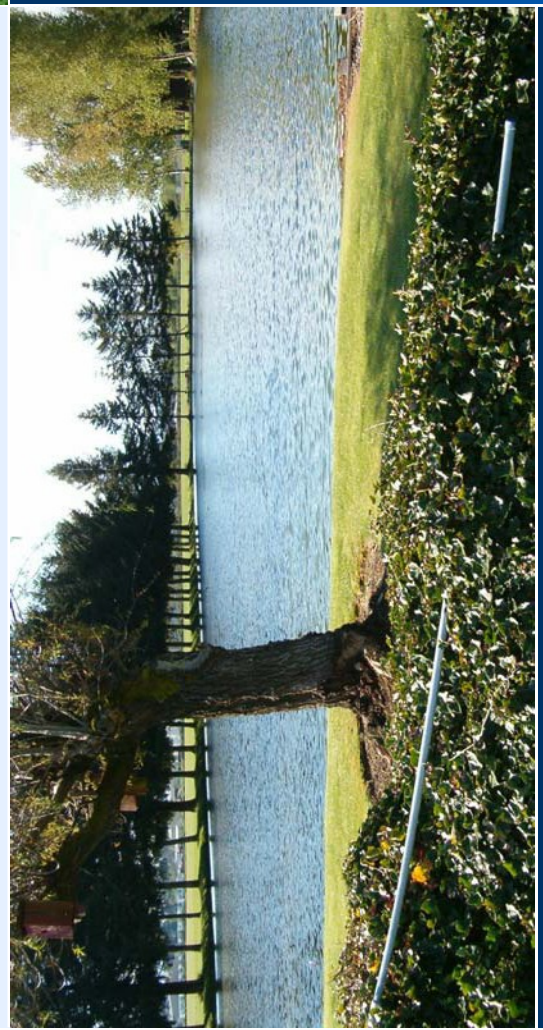
Appendix D

Water Quality Related Data

D.1 - Storm Water Quality Lab Report
D.2 - Management Strategies
D.3 - NPDES Plan
D.4 - TMDL
D.5 - UIC



Appendix D.1

Storm Water Quality Lab Report

KELLER associates

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ANALYTICAL TESTING CORPORATION

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

March 19, 2007

Brenda Kuiken
City of Stayton
362 N Third Avenue
Stayton, OR 97383

RE: Stormwater Testing

Enclosed are the results of analyses for samples received by the laboratory on 03/01/07 14:56. The following list is a summary of the Work Orders contained in this report, generated on 03/19/07 17:28.

If you have any questions concerning this report, please feel free to contact me.

Work Order	Project	ProjectNumber
PQC0032	Stormwater Testing	Stormwater Testing

Brian Cone, Industrial Services Manager

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City of Stayton	Project Name:	**Stormwater Testing**	
362 N Third Avenue	Project Number:	Stormwater Testing	Report Created:
Stayton, OR 97383	Project Manager:	Brenda Kuiken	03/19/07 17:28

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
INLET	PQC0032-01	Water	03/01/07 10:20	03/01/07 14:56
6 AVE	PQC0032-02	Water	03/01/07 11:20	03/01/07 14:56
OUTLET	PQC0032-03	Water	03/01/07 12:00	03/01/07 14:56
CCH BSN	PQC0032-04	Water	03/01/07 12:50	03/01/07 14:56

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Total Metals per EPA 200 Series Methods

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Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PQC0032-01 (INLET)		**Water**				**Sampled: 03/01/07 10:20**				
Calcium	EPA 200.7	**3.57**	-----	0.100	mg/l	1x	7030531	03/14/07 11:27	03/16/07 20:21	
Copper	EPA 200.8	ND	-----	0.00200	"	"	7030485	03/13/07 14:22	03/15/07 01:05	
Lead	"	ND	-----	0.00100	"	"	"	"	"	
Magnesium	EPA 200.7	**1.09**	-----	0.100	"	"	7030531	03/14/07 11:27	03/16/07 20:21	
Zinc	EPA 200.8	ND	-----	0.00500	"	"	7030485	03/13/07 14:22	03/15/07 01:05	
PQC0032-02 (6 AVE)		**Water**				**Sampled: 03/01/07 11:20**				
Calcium	EPA 200.7	**11.9**	-----	0.100	mg/l	1x	7030531	03/14/07 11:27	03/16/07 20:40	
Copper	EPA 200.8	ND	-----	0.00200	"	"	7030485	03/13/07 14:22	03/15/07 01:12	
Lead	"	ND	-----	0.00100	"	"	"	"	"	
Magnesium	EPA 200.7	**2.60**	-----	0.100	"	"	7030531	03/14/07 11:27	03/16/07 20:40	
Zinc	EPA 200.8	ND	-----	0.00500	"	"	7030485	03/13/07 14:22	03/15/07 01:12	
PQC0032-03 (OUTLET)		**Water**				**Sampled: 03/01/07 12:00**				
Calcium	EPA 200.7	**4.24**	-----	0.100	mg/l	1x	7030531	03/14/07 11:27	03/16/07 20:46	
Copper	EPA 200.8	ND	-----	0.00200	"	"	7030485	03/13/07 14:22	03/15/07 01:20	
Lead	"	ND	-----	0.00100	"	"	"	"	"	
Magnesium	EPA 200.7	**1.16**	-----	0.100	"	"	7030531	03/14/07 11:27	03/16/07 20:46	
Zinc	EPA 200.8	ND	-----	0.00500	"	"	7030485	03/13/07 14:22	03/15/07 01:20	
PQC0032-04 (CCH BSN)		**Water**				**Sampled: 03/01/07 12:50**				
Calcium	EPA 200.7	**10.5**	-----	0.100	mg/l	1x	7030531	03/14/07 11:27	03/16/07 20:53	
Copper	EPA 200.8	ND	-----	0.00200	"	"	7030485	03/13/07 14:22	03/15/07 01:27	
Lead	"	ND	-----	0.00100	"	"	"	"	"	
Magnesium	EPA 200.7	**2.49**	-----	0.100	"	"	7030531	03/14/07 11:27	03/16/07 20:53	
Zinc	EPA 200.8	**0.0202**	-----	0.00500	"	"	7030485	03/13/07 14:22	03/15/07 01:27	

Brian Cone, Industrial Services Manager

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Dissolved Metals per EPA 200 Series Methods

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Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PQC0032-01 (INLET)		**Water**				**Sampled: 03/01/07 10:20**				
Copper	EPA 200.8	ND	-----	0.00200	mg/l	1x	7030142	03/05/07 10:09	03/06/07 15:57	
PQC0032-02 (6 AVE)		**Water**				**Sampled: 03/01/07 11:20**				
Copper	EPA 200.8	ND	-----	0.00200	mg/l	1x	7030142	03/05/07 10:09	03/06/07 16:01	
PQC0032-03 (OUTLET)		**Water**				**Sampled: 03/01/07 12:00**				
Copper	EPA 200.8	ND	-----	0.00200	mg/l	1x	7030142	03/05/07 10:09	03/06/07 16:05	
PQC0032-04 (CCH BSN)		**Water**				**Sampled: 03/01/07 12:50**				
Copper	EPA 200.8	ND	-----	0.00200	mg/l	1x	7030142	03/05/07 10:09	03/06/07 16:09	

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Total Mercury per EPA Method 245.1

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Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PQC0032-01 (INLET)		**Water**				**Sampled: 03/01/07 10:20**				
Mercury	EPA 245.1	ND	-----	0.000200	mg/l	1x	7030245	03/07/07 12:11	03/07/07 17:59	
PQC0032-02 (6 AVE)		**Water**				**Sampled: 03/01/07 11:20**				
Mercury	EPA 245.1	ND	-----	0.000200	mg/l	1x	7030245	03/07/07 12:11	03/07/07 18:01	
PQC0032-03 (OUTLET)		**Water**				**Sampled: 03/01/07 12:00**				
Mercury	EPA 245.1	ND	-----	0.000200	mg/l	1x	7030245	03/07/07 12:11	03/07/07 18:03	
PQC0032-04 (CCH BSN)		**Water**				**Sampled: 03/01/07 12:50**				
Mercury	EPA 245.1	ND	-----	0.000200	mg/l	1x	7030245	03/07/07 12:11	03/07/07 18:06	

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City of Stayton	Project Name:	**Stormwater Testing**	
362 N Third Avenue	Project Number:	Stormwater Testing	Report Created:
Stayton, OR 97383	Project Manager:	Brenda Kuiken	03/19/07 17:28

Conventional Chemistry Parameters per APHA/EPA Methods

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Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PQC0032-01 (INLET)		**Water**			**Sampled: 03/01/07 10:20**					
Biochemical Oxygen Demand	EPA 405.1	ND	-----	4.00	mg/l	1x	7030064	03/02/07 08:59	03/07/07 18:47	
Chemical Oxygen Demand	EPA 410.4	**5.12**	-----	5.00	"	"	7030506	03/14/07 08:51	03/14/07 14:50	
Orthophosphate-phosphorus	EPA 365.2	ND	-----	0.0100	"	"	7030058	03/02/07 07:52	03/02/07 10:40	
Specific Conductivity	120.1/ 9050	**37.3**	-----	10.0	uS/cm	"	7030149	03/05/07 11:05	03/05/07 12:19	
Total Solids	EPA 160.3	**62.0**	-----	10.0	mg/l	"	7030316	03/08/07 14:40	03/08/07 16:57	
Total Suspended Solids	EPA 160.2/SM 2540D	**20.0**	-----	10.0	"	"	7030241	03/07/07 10:43	03/07/07 15:47	
Turbidity	EPA 180.1	**3.22**	-----	0.200	NTU	"	7030051	03/02/07 07:11	03/02/07 09:10	
Hardness	SM2340B	**13.4**	-----	0.662	mg/l	"	[CALC]	03/14/07 11:27	03/16/07 20:21	
pH	EPA 150.1	**7.33**	-----		pH Units	"	7030050	03/02/07 07:10	03/02/07 08:30	
Phosphorus	EPA 365.1	**0.0498**	-----	0.0200	mg/l	"	7030280	03/08/07 09:45	03/09/07 15:00	
PQC0032-02 (6 AVE)		**Water**			**Sampled: 03/01/07 11:20**					
Biochemical Oxygen Demand	EPA 405.1	ND	-----	4.00	mg/l	1x	7030064	03/02/07 08:59	03/07/07 18:47	
Chemical Oxygen Demand	EPA 410.4	ND	-----	5.00	"	"	7030506	03/14/07 08:51	03/14/07 14:50	
Orthophosphate-phosphorus	EPA 365.2	ND	-----	0.0100	"	"	7030058	03/02/07 07:52	03/02/07 10:40	
Specific Conductivity	120.1/ 9050	**116**	-----	10.0	uS/cm	"	7030149	03/05/07 11:05	03/05/07 12:19	
Total Solids	EPA 160.3	**105**	-----	10.0	mg/l	"	7030316	03/08/07 14:40	03/08/07 16:57	
Total Suspended Solids	EPA 160.2/SM 2540D	ND	-----	10.0	"	"	7030241	03/07/07 10:43	03/07/07 15:47	
Turbidity	EPA 180.1	**2.57**	-----	0.200	NTU	"	7030051	03/02/07 07:11	03/02/07 09:10	
Hardness	SM2340B	**40.4**	-----	0.662	mg/l	"	[CALC]	03/14/07 11:27	03/16/07 20:40	
pH	EPA 150.1	**7.10**	-----		pH Units	"	7030050	03/02/07 07:10	03/02/07 08:30	
Phosphorus	EPA 365.1	**0.0274**	-----	0.0200	mg/l	"	7030280	03/08/07 09:45	03/09/07 15:00	
PQC0032-03 (OUTLET)		**Water**			**Sampled: 03/01/07 12:00**					
Biochemical Oxygen Demand	EPA 405.1	ND	-----	4.00	mg/l	1x	7030064	03/02/07 08:59	03/07/07 18:47	
Chemical Oxygen Demand	EPA 410.4	ND	-----	5.00	"	"	7030506	03/14/07 08:51	03/14/07 14:50	
Orthophosphate-phosphorus	EPA 365.2	ND	-----	0.0100	"	"	7030058	03/02/07 07:52	03/02/07 10:40	
Specific Conductivity	120.1/ 9050	**44.0**	-----	10.0	uS/cm	"	7030149	03/05/07 11:05	03/05/07 12:19	
Total Solids	EPA 160.3	**45.0**	-----	10.0	mg/l	"	7030316	03/08/07 14:40	03/08/07 16:57	
Total Suspended Solids	EPA 160.2/SM 2540D	ND	-----	10.0	"	"	7030241	03/07/07 10:43	03/07/07 15:47	
Turbidity	EPA 180.1	**2.13**	-----	0.200	NTU	"	7030051	03/02/07 07:11	03/02/07 09:10	
Hardness	SM2340B	**15.4**	-----	0.662	mg/l	"	[CALC]	03/14/07 11:27	03/16/07 20:46	
pH	EPA 150.1	**7.31**	-----		pH Units	"	7030050	03/02/07 07:10	03/02/07 08:30	
Phosphorus	EPA 365.1	**0.0225**	-----	0.0200	mg/l	"	7030280	03/08/07 09:45	03/09/07 15:00	

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362 N Third Avenue	Project Number:	Stormwater Testing	Report Created:
Stayton, OR 97383	Project Manager:	Brenda Kuiken	03/19/07 17:28

Conventional Chemistry Parameters per APHA/EPA Methods

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Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PQC0032-04 (CCH BSN)		**Water**				**Sampled: 03/01/07 12:50**				
Biochemical Oxygen Demand	EPA 405.1	ND	-----	4.00	mg/l	1x	7030064	03/02/07 08:59	03/07/07 18:47	
Chemical Oxygen Demand	EPA 410.4	**6.66**	-----	5.00	"	"	7030506	03/14/07 08:51	03/14/07 14:50	
Orthophosphate-phosphorus	EPA 365.2	ND	-----	0.0100	"	"	7030058	03/02/07 07:52	03/02/07 10:40	
Specific Conductivity	120.1/ 9050	**118**	-----	10.0	uS/cm	"	7030149	03/05/07 11:05	03/05/07 12:19	
Total Solids	EPA 160.3	**96.0**	-----	10.0	mg/l	"	7030316	03/08/07 14:40	03/08/07 16:57	
Total Suspended Solids	EPA 160.2/SM 2540D	ND	-----	10.0	"	"	7030241	03/07/07 10:43	03/07/07 15:47	
Turbidity	EPA 180.1	**3.18**	-----	0.200	NTU	"	7030051	03/02/07 07:11	03/02/07 09:10	
Hardness	SM2340B	**36.5**	-----	0.662	mg/l	"	[CALC]	03/14/07 11:27	03/16/07 20:53	
pH	EPA 150.1	**6.95**	-----		pH Units	"	7030050	03/02/07 07:10	03/02/07 08:30	
Phosphorus	EPA 365.1	**0.0204**	-----	0.0200	mg/l	"	7030280	03/08/07 09:45	03/09/07 15:00	

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362 N Third Avenue	Project Number:	Stormwater Testing	Report Created:
Stayton, OR 97383	Project Manager:	Brenda Kuiken	03/19/07 17:28

Microbiological Parameters per APHA Standard Methods

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Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PQC0032-01 (INLET)		**Water**					**Sampled: 03/01/07 10:20**			
E. Coli	SM 9223B	**6.30**	-----	1.00	MPN/100 ml	1x	7030071	03/02/07 09:45	03/03/07 19:20	
PQC0032-02 (6 AVE)		**Water**					**Sampled: 03/01/07 11:20**			
E. Coli	SM 9223B	**7.20**	-----	1.00	MPN/100 ml	1x	7030071	03/02/07 09:45	03/03/07 19:20	
PQC0032-03 (OUTLET)		**Water**					**Sampled: 03/01/07 12:00**			
E. Coli	SM 9223B	**14.8**	-----	1.00	MPN/100 ml	1x	7030071	03/02/07 09:45	03/03/07 19:20	
PQC0032-04 (CCH BSN)		**Water**					**Sampled: 03/01/07 12:50**			
E. Coli	SM 9223B	**26.9**	-----	1.00	MPN/100 ml	1x	7030071	03/02/07 09:45	03/03/07 19:20	

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362 N Third Avenue	Project Number:	Stormwater Testing	Report Created:
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Total Metals per EPA 200 Series Methods - Laboratory Quality Control Results

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QC Batch: 7030485 **Water Preparation Method: EPA 200/3005**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7030485-BLK1)								**Extracted: 03/13/07 14:22**						
Copper	EPA 200.8	ND	---	0.00200	mg/l	1x	--	--	--	--	--	--	03/14/07 20:19	
Lead	"	ND	---	0.00100	"	"	--	--	--	--	--	--	"	
Zinc	"	ND	---	0.00500	"	"	--	--	--	--	--	--	03/15/07 13:37	
LCS (7030485-BS1)								**Extracted: 03/13/07 14:22**						
Copper	EPA 200.8	0.0861	---	0.00200	mg/l	1x	--	0.100	86.1%	(85-115)	--	--	03/14/07 20:26	
Lead	"	0.0896	---	0.00100	"	"	--	"	89.6%	"	--	--	"	
Zinc	"	0.0858	---	0.0100	"	2x	--	"	85.8%	"	--	--	03/15/07 13:44	
Duplicate (7030485-DUP1)				**QC Source: PQB0979-01**				**Extracted: 03/13/07 14:22**						
Copper	EPA 200.8	ND	---	0.00200	mg/l	1x	ND	--	--	--	3.71%	(20)	03/14/07 20:41	
Lead	"	ND	---	0.00100	"	"	ND	--	--	--	24.4%	"	"	R4
Zinc	"	0.0501	---	0.00500	"	"	0.0500	--	--	--	0.200%	"	03/15/07 13:59	
Matrix Spike (7030485-MS1)				**QC Source: PQC0019-29**				**Extracted: 03/13/07 14:22**						
Copper	EPA 200.8	0.115	---	0.00200	mg/l	1x	0.0350	0.100	80.0%	(75-125)	--	--	03/14/07 20:48	
Lead	"	0.0854	---	0.00100	"	"	0.000770	"	84.6%	"	--	--	"	
Zinc	"	0.180	---	0.00500	"	"	0.105	"	75.0%	(70-130)	--	--	03/15/07 14:06	
Matrix Spike (7030485-MS2)				**QC Source: PQB0979-01**				**Extracted: 03/13/07 14:22**						
Copper	EPA 200.8	0.0863	---	0.00200	mg/l	1x	0.00185	0.100	84.4%	(75-125)	--	--	03/14/07 21:10	
Lead	"	0.0882	---	0.00100	"	"	0.000230	"	88.0%	"	--	--	"	
Zinc	"	0.127	---	0.00500	"	"	0.0500	"	77.0%	(70-130)	--	--	03/15/07 14:21	

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City of Stayton	Project Name:	**Stormwater Testing**	
362 N Third Avenue	Project Number:	Stormwater Testing	Report Created:
Stayton, OR 97383	Project Manager:	Brenda Kuiken	03/19/07 17:28

Total Metals per EPA 200 Series Methods - Laboratory Quality Control Results

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QC Batch: 7030531 **Water Preparation Method: EPA 200/3005**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7030531-BLK1)								**Extracted: 03/14/07 11:27**						
Calcium	EPA 200.7	ND	---	0.100	mg/l	1x	--	--	--	--	--	--	03/15/07 12:43	
Magnesium	"	ND	---	0.100	"	"	--	--	--	--	--	--	"	
LCS (7030531-BS1)								**Extracted: 03/14/07 11:27**						
Calcium	EPA 200.7	9.26	---	0.100	mg/l	1x	--	10.0	92.6%	(85-115)	--	--	03/15/07 12:49	
Magnesium	"	9.49	---	0.100	"	"	--	"	94.9%	"	--	--	"	
Duplicate (7030531-DUP1)					**QC Source: PQC0025-01**				**Extracted: 03/14/07 11:27**					
Calcium	EPA 200.7	12.4	---	0.100	mg/l	1x	12.0	--	--	--	3.28%	(20)	03/16/07 20:33	
Magnesium	"	1.63	---	0.100	"	"	1.57	--	--	--	3.75%	"	"	
Matrix Spike (7030531-MS1)					**QC Source: PQC0025-02**				**Extracted: 03/14/07 11:27**					
Calcium	EPA 200.7	19.1	---	0.100	mg/l	1x	10.2	10.0	89.0%	(75-125)	--	--	03/16/07 20:08	
Magnesium	"	4.25	---	0.100	"	"	1.55	"	27.0%	"	--	--	03/15/07 13:18	M2
Matrix Spike (7030531-MS2)					**QC Source: PQC0032-01**				**Extracted: 03/14/07 11:27**					
Calcium	EPA 200.7	21.6	---	0.100	mg/l	1x	3.57	10.0	180%	(75-125)	--	--	03/16/07 20:27	M2
Magnesium	"	2.55	---	0.100	"	"	1.09	"	14.6%	"	--	--	03/15/07 13:31	M2

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ANALYTICAL TESTING CORPORATION

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

City of Stayton	Project Name:	**Stormwater Testing**	
362 N Third Avenue	Project Number:	Stormwater Testing	Report Created:
Stayton, OR 97383	Project Manager:	Brenda Kuiken	03/19/07 17:28

Dissolved Metals per EPA 200 Series Methods - Laboratory Quality Control Results

TestAmerica - Portland, OR

QC Batch: 7030142 **Water Preparation Method: EPA 200/3005 Diss**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7030142-BLK1)								**Extracted: 03/05/07 10:09**						
Copper	EPA 200.8	ND	---	0.00200	mg/l	1x	--	--	--	--	--	--	03/06/07 15:17	
LCS (7030142-BS1)								**Extracted: 03/05/07 10:09**						
Copper	EPA 200.8	0.104	---	0.00200	mg/l	1x	--	0.100	104%	(85-115)	--	--	03/06/07 15:21	
Duplicate (7030142-DUP1)					**QC Source: PQB0510-01**				**Extracted: 03/05/07 10:09**					
Copper	EPA 200.8	ND	---	0.00200	mg/l	1x	ND	--	--	--	15.6%	(20)	03/06/07 15:29	
Matrix Spike (7030142-MS1)					**QC Source: PQB0860-17**				**Extracted: 03/05/07 10:09**					
Copper	EPA 200.8	0.124	---	0.00200	mg/l	1x	0.0176	0.100	106%	(70-130)	--	--	03/06/07 15:45	

Brian L Cone

Brian Cone, Industrial Services Manager

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City of Stayton	Project Name:	**Stormwater Testing**	
362 N Third Avenue	Project Number:	Stormwater Testing	Report Created:
Stayton, OR 97383	Project Manager:	Brenda Kuiken	03/19/07 17:28

Total Mercury per EPA Method 245.1 - Laboratory Quality Control Results

TestAmerica - Portland, OR

QC Batch: 7030245 **Water Preparation Method: EPA 245.1**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7030245-BLK1)									Extracted: 03/07/07 12:11					
Mercury	EPA 245.1	ND	---	0.000200	mg/l	1x	--	--	--	--	--	--	03/07/07 17:22	
LCS (7030245-BS1)									Extracted: 03/07/07 12:11					
Mercury	EPA 245.1	0.00508	---	0.000200	mg/l	1x	--	0.00500	102%	(85-115)	--	--	03/07/07 17:24	
LCS Dup (7030245-BSD1)									Extracted: 03/07/07 12:11					
Mercury	EPA 245.1	0.00527	---	0.000200	mg/l	1x	--	0.00500	105%	(85-115)	3.67%	(20)	03/07/07 17:29	
Duplicate (7030245-DUP1)					QC Source: PQB0975-01				Extracted: 03/07/07 12:11					
Mercury	EPA 245.1	ND	---	0.000200	mg/l	1x	ND	--	--	--	NR	(20)	03/07/07 17:33	
Matrix Spike (7030245-MS1)					QC Source: PQB0975-01				Extracted: 03/07/07 12:11					
Mercury	EPA 245.1	0.00499	---	0.000200	mg/l	1x	ND	0.00500	99.8%	(75-125)	--	--	03/07/07 17:35	
Matrix Spike (7030245-MS2)					QC Source: PQC0061-05				Extracted: 03/07/07 12:11					
Mercury	EPA 245.1	0.00545	---	0.000200	mg/l	1x	0.000149	0.00500	106%	(75-125)	--	--	03/07/07 17:42	
Matrix Spike Dup (7030245-MSD1)					QC Source: PQB0975-01				Extracted: 03/07/07 12:11					
Mercury	EPA 245.1	0.00497	---	0.000200	mg/l	1x	ND	0.00500	99.4%	(75-125)	0.402%	(20)	03/07/07 17:39	
Matrix Spike Dup (7030245-MSD2)					QC Source: PQC0061-05				Extracted: 03/07/07 12:11					
Mercury	EPA 245.1	0.00535	---	0.000200	mg/l	1x	0.000149	0.00500	104%	(75-125)	1.85%	(20)	03/07/07 17:46	

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Brian Cone, Industrial Services Manager

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City of Stayton	Project Name:	**Stormwater Testing**	
362 N Third Avenue	Project Number:	Stormwater Testing	Report Created:
Stayton, OR 97383	Project Manager:	Brenda Kuiken	03/19/07 17:28

Conventional Chemistry Parameters per APHA/EPA Methods - Laboratory Quality Control Results

TestAmerica - Portland, OR

QC Batch: 7030050 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Duplicate (7030050-DUP1)					**QC Source: PQC0032-01**				**Extracted: 03/02/07 07:10**					
pH	EPA 150.1	7.34	---		pH Units	1x	7.33	--	--	--	0.136%	(25)	03/02/07 08:30	

QC Batch: 7030051 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7030051-BLK1)									**Extracted: 03/02/07 07:11**					
Turbidity	EPA 180.1	ND	---	0.200	NTU	1x	--	--	--	--	--	--	03/02/07 09:10	
LCS (7030051-BS1)									**Extracted: 03/02/07 07:11**					
Turbidity	EPA 180.1	18.0	---	0.200	NTU	1x	--	20.0	90.0%	(85-115)	--	--	03/02/07 09:10	
Duplicate (7030051-DUP1)					**QC Source: PQC0028-01**				**Extracted: 03/02/07 07:11**					
Turbidity	EPA 180.1	ND	---	0.200	NTU	1x	ND	--	--	--	22.9%	(20)	03/02/07 09:10	R4

QC Batch: 7030058 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7030058-BLK1)									**Extracted: 03/02/07 07:52**					
Orthophosphate-phosphorus	EPA 365.2	ND	---	0.0100	mg/l	1x	--	--	--	--	--	--	03/02/07 10:40	
LCS (7030058-BS1)									**Extracted: 03/02/07 07:52**					
Orthophosphate-phosphorus	EPA 365.2	0.291	---	0.0100	mg/l	1x	--	0.300	97.0%	(85-115)	--	--	03/02/07 10:40	
Duplicate (7030058-DUP1)					**QC Source: PQC0032-01**				**Extracted: 03/02/07 07:52**					
Orthophosphate-phosphorus	EPA 365.2	ND	---	0.0100	mg/l	1x	ND	--	--	--	NR	(20)	03/02/07 10:40	
Matrix Spike (7030058-MS1)					**QC Source: PQC0032-01**				**Extracted: 03/02/07 07:52**					
Orthophosphate-phosphorus	EPA 365.2	0.0660	---	0.0100	mg/l	1x	ND	0.100	66.0%	(80-120)	--	--	03/02/07 10:40	M2

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City of Stayton	Project Name:	**Stormwater Testing**	
362 N Third Avenue	Project Number:	Stormwater Testing	Report Created:
Stayton, OR 97383	Project Manager:	Brenda Kuiken	03/19/07 17:28

Conventional Chemistry Parameters per APHA/EPA Methods - Laboratory Quality Control Results

TestAmerica - Portland, OR

QC Batch: 7030064 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7030064-BLK1)									Extracted: 03/02/07 08:59					
Biochemical Oxygen Demand	EPA 405.1	ND	---	4.00	mg/l	1x	--	--	--	--	--	--	03/07/07 18:47	K3
LCS (7030064-BS1)									Extracted: 03/02/07 08:59					
Biochemical Oxygen Demand	EPA 405.1	179	---	4.00	mg/l	1x	--	198	90.4%	(85-115)	--	--	03/07/07 18:47	
Duplicate (7030064-DUP1)							QC Source: PQB0956-02						Extracted: 03/02/07 08:59	
Biochemical Oxygen Demand	EPA 405.1	ND	---	4.00	mg/l	1x	ND	--	--	--	NR	(40)	03/07/07 18:47	

QC Batch: 7030149 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7030149-BLK1)									Extracted: 03/05/07 11:05					
Specific Conductivity	120.1/ 9050	ND	---	10.0	uS/cm	1x	--	--	--	--	--	--	03/05/07 12:19	
LCS (7030149-BS1)									Extracted: 03/05/07 11:05					
Specific Conductivity	120.1/ 9050	1390	---	10.0	uS/cm	1x	--	1410	98.6%	(85-115)	--	--	03/05/07 12:19	
Duplicate (7030149-DUP1)							QC Source: PQB0836-01						Extracted: 03/05/07 11:05	
Specific Conductivity	120.1/ 9050	2780	---	10.0	uS/cm	1x	2830	--	--	--	1.78%	(20)	03/05/07 12:19	

QC Batch: 7030241 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7030241-BLK1)									Extracted: 03/07/07 10:43					
Total Suspended Solids	EPA 160.2/SM 2540D	ND	---	10.0	mg/l	1x	--	--	--	--	--	--	03/07/07 15:47	
LCS (7030241-BS1)									Extracted: 03/07/07 10:43					
Total Suspended Solids	EPA 160.2/SM 2540D	48.0	---	10.0	mg/l	1x	--	50.0	96.0%	(80-120)	--	--	03/07/07 15:47	
Duplicate (7030241-DUP1)							QC Source: PQB0968-01						Extracted: 03/07/07 10:43	
Total Suspended Solids	EPA 160.2/SM 2540D	ND	---	10.0	mg/l	1x	ND	--	--	--	NR	(20)	03/07/07 15:47	

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City of Stayton	Project Name:	**Stormwater Testing**	
362 N Third Avenue	Project Number:	Stormwater Testing	Report Created:
Stayton, OR 97383	Project Manager:	Brenda Kuiken	03/19/07 17:28

Conventional Chemistry Parameters per APHA/EPA Methods - Laboratory Quality Control Results

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QC Batch: 7030280 **Water Preparation Method: Wet Chem**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7030280-BLK1)									**Extracted: 03/08/07 09:45**					
Phosphorus	EPA 365.1	ND	---	0.0200	mg/l	1x	--	--	--	--	--	--	03/09/07 15:00	
LCS (7030280-BS1)									**Extracted: 03/08/07 09:45**					
Phosphorus	EPA 365.1	0.420	---	0.0200	mg/l	1x	--	0.400	105%	(90-110)	--	--	03/09/07 15:00	
Duplicate (7030280-DUP1)					**QC Source: PQB0939-01**				**Extracted: 03/08/07 09:45**					
Phosphorus	EPA 365.1	0.607	---	0.100	mg/l	5x	0.452	--	--	--	29.3%	(20)	03/09/07 15:00	R2
Matrix Spike (7030280-MS1)					**QC Source: PQB0939-01**				**Extracted: 03/08/07 09:45**					
Phosphorus	EPA 365.1	0.776	---	0.100	mg/l	5x	0.452	0.400	81.0%	(90-110)	--	--	03/09/07 15:00	M1

QC Batch: 7030316 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7030316-BLK1)									**Extracted: 03/08/07 14:40**					
Total Solids	EPA 160.3	ND	---	10.0	mg/l	1x	--	--	--	--	--	--	03/08/07 16:57	
Blank (7030316-BLK2)									**Extracted: 03/08/07 14:40**					
Total Solids	EPA 160.3	ND	---	10.0	mg/l	1x	--	--	--	--	--	--	03/08/07 16:57	
LCS (7030316-BS1)									**Extracted: 03/08/07 14:40**					
Total Solids	EPA 160.3	49.0	---	10.0	mg/l	1x	--	50.0	98.0%	(80-120)	--	--	03/08/07 16:57	
LCS (7030316-BS2)									**Extracted: 03/08/07 14:40**					
Total Solids	EPA 160.3	52.0	---	10.0	mg/l	1x	--	50.0	104%	(80-120)	--	--	03/08/07 16:57	
Duplicate (7030316-DUP1)					**QC Source: PQC0032-03**				**Extracted: 03/08/07 14:40**					
Total Solids	EPA 160.3	47.0	---	10.0	mg/l	1x	45.0	--	--	--	4.35%	(20)	03/08/07 16:57	
Duplicate (7030316-DUP2)					**QC Source: PQC0032-04**				**Extracted: 03/08/07 14:40**					
Total Solids	EPA 160.3	96.0	---	10.0	mg/l	1x	96.0	--	--	--	0.00%	(20)	03/08/07 16:57	

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Brian Cone, Industrial Services Manager

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City of Stayton	Project Name:	**Stormwater Testing**	
362 N Third Avenue	Project Number:	Stormwater Testing	Report Created:
Stayton, OR 97383	Project Manager:	Brenda Kuiken	03/19/07 17:28

Conventional Chemistry Parameters per APHA/EPA Methods - Laboratory Quality Control Results

TestAmerica - Portland, OR

QC Batch: 7030506 **Water Preparation Method: General Preparation**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (7030506-BLK1)								**Extracted: 03/14/07 08:51**						
Chemical Oxygen Demand	EPA 410.4	ND	---	5.00	mg/l	1x	--	--	--	--	--	--	03/14/07 14:50	
LCS (7030506-BS1)								**Extracted: 03/14/07 08:51**						
Chemical Oxygen Demand	EPA 410.4	50.9	---	5.00	mg/l	1x	--	50.0	102%	(90-110)	--	--	03/14/07 14:50	
Duplicate (7030506-DUP1)						**QC Source: PQC0032-01**			**Extracted: 03/14/07 08:51**					
Chemical Oxygen Demand	EPA 410.4	ND	---	5.00	mg/l	1x	5.12	--	--	--	--	(20)	03/14/07 14:50	

Brian L Cone

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City of Stayton	Project Name:	**Stormwater Testing**	
362 N Third Avenue	Project Number:	Stormwater Testing	Report Created:
Stayton, OR 97383	Project Manager:	Brenda Kuiken	03/19/07 17:28

Notes and Definitions

Report Specific Notes:

K3	-	The dilution water D.O. depletion was > 0.2 mg/L.
M1	-	The MS and/or MSD were above the acceptance limits due to sample matrix interference. See Blank Spike (LCS).
M2	-	The MS and/or MSD were below the acceptance limits due to sample matrix interference. See Blank Spike (LCS).
R2	-	The RPD exceeded the acceptance limit.
R4	-	Due to the low levels of analyte in the sample, the duplicate RPD calculation does not provide useful information.

Laboratory Reporting Conventions:

DET	-	Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
ND	-	Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
NR/NA	-	Not Reported / Not Available
dry	-	Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
wet	-	Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
RPD	-	RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
MRL	-	METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
MDL*	-	METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
Dil	-	Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
Reporting Limits	-	Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
Electronic Signature	-	Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica
ANALYTICAL TESTING CORPORATION

11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244 425-420-9200 FAX 420-9210
11922 E. First Ave, Spokane, WA 99206-5302 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave, Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210

CHAIN OF CUSTODY REPORT

Work Order #: YQL0732

CLIENT: CITY OF STAYTON
REPORT TO: BRENDA KUIKEN
ADDRESS: 362 N 3RD AVE
STAYTON, OREGON
PHONE: 503 769 2810 FAX:

INVOICE TO:
CITY OF STAYTON
362 N 3rd Ave
STAYTON, OREGON 97383

P.O. NUMBER: WWTF

PROJECT NAME: STORMWATER TESTING
PROJECT NUMBER:
SAMPLED BY: JOHN L SULLIVAN JR

TURNAROUND REQUEST
in Business Days *
Organic & Inorganic Analyses: 10 STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1
Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PRESERVATIVE	REQUESTED ANALYSES												MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	TA WO ID
			—	HNO3	HNO3	HNO3	H2SO4												
			Fecal	Hg, Cu Zn, Pb	Dis Cu	Hardness	COD Ophos	BOD	tphos	TS	TSS	TURB	pH	Bioassay					
1	INLET	3-1-07 1020	✓	—	—	—	—	—	✓	✓	✓	✓	✓	✓		W	5		
2	CAVE	3-1-07 1120	✓	—	—	—	✓	✓	✓	✓	✓	✓	✓	✓		W	5		
3	OUTLET	3-1-07 1200	✓	✓	✓	✓	✓	✓	—	✓	✓	✓	✓	✓		W	5		
4	CCH BSN	3-1-07 1250	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		W	5		
5													✓						
6																			
7																			
8																			
9																			
10																			

RELEASED BY: JOHN L SULLIVAN JR FIRM: CITY OF STAYTON DATE: 3-1-07 TIME:
RECEIVED BY: Camille Holladay PRINT NAME: Camille Holladay FIRM: TAP DATE: 3/1/07 TIME: 1456
RELEASED BY: PRINT NAME: FIRM: DATE: TIME:
RECEIVED BY: PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS:

TEMP: 4.3

COC REV 05/2006 PAGE OF

Note: By relinquishing samples to TestAmerica, client agrees to pay for the services requested on this chain of custody form and for any additional analyses performed on this project.
Payment for services is due within 30 days from the date of invoice unless otherwise contracted. Sample(s) will be disposed of after 30 days unless otherwise contracted.

TEST AMERICA SAMPLE RECEIPT CHECKLIST

Received By: (applies to temp at receipt)
Date: 3/1/07
Time: 1458
Initials: CH

Logged-in By:
Date: 3/1/07
Initials: CH

Unpacked/Labeled By:
Date: 3/1/07
Initials: CH

Cooler ID: ____ (___ of ___)

Work Order No. 8Q10032
Client: City of Staton
Project: Stormwater

Container Type:
✓ Cooler
___ Box
___ None/Other ____

COC Seals:
✓ Ship. Container
___ On Bottles
✓ Sign By
___ Date
___ None

Packing Material
___ Bubble Bags ___ Styrofoam
___ Foam Packs
✓ None/Other Other ____

Refrigerant:
✓ Gel Ice Pack ____ ___ None
___ Loose Ice
___ None/Other ____

Received Via: Bill#
___ Fed Ex ✓ Client
___ UPS ___ NCA Courier
___ DHL ___ Mid Valley
___ Senvoy ___ TDP
___ GS ___ Other ____

Cooler Temperature (IR): 4.3 °C (Plastic) Glass (Frozen filters, Tedlars and aqueous Metals exempt)
(circle one)

Temperature Blank? ____ °C or (NA)

Trip Blank? Y or N or (NA)

Sample Containers:		ID			ID
Intact?	(Y) or N	____	Metals Preserved?	(Y) or N or NA	____
Provided by NCA?	(Y) or N	____	Client QAPP Preserved?	Y or N or (NA)	____
Correct Type?	(Y) or N	____	Adequate Volume? (for tests requested)	(Y) or N	____
#Containers match COC?	(Y) or N	____	Water VOAs: Headspace?	Y or N or (NA)	____
IDs/time/date match COC?	(Y) or N	____	Comments:		
Hold Times in hold?	(Y) or N	____			

PROJECT MANAGEMENT

Is the Chain of Custody complete? Y or N If N, circle the items that were incomplete

Comments, Problems ____

Total access set up? Y or N
Has client been contacted regarding non-conformances? Y or N If Y ____/____ Date Time

PM Initials: ____ Date: ____ Time: ____

(rev 3, 09/12/05)

Appendix D.2

Management Strategies

KELLER associates

TETRA TECH/KCM
7080 SW Fir Loop
Portland, Oregon 97223-8022

Technical Memorandum

City of Stayton
STRATEGY FOR ADDRESSING STORMWATER MANAGEMENT

January 5, 2007

OVERVIEW

This technical memorandum presents a preliminary strategy for the City of Stayton to manage stormwater in a way that addresses existing and potential future regulatory requirements. The preliminary strategy is a starting point for developing a final long-term overall strategy. This memorandum describes current and potential future regulatory requirements, approaches to addressing the requirements, and how the approaches have worked for other communities. It describes how state and federal requirements can be met in a way that is most economical and beneficial to the citizens and environment of Stayton.

A stormwater management strategy must incorporate the goals of the community and input from City staff who will implement it. This memorandum was prepared to help elected officials, staff and citizens who must plan and implement programs to comply with regulations and protect local water quality.

The City of Stayton was not identified as a community included in the National Pollutant Discharge Elimination System (NPDES) Phase II program. However, the Oregon Department of Environmental Quality (DEQ) has developed the NPDES Phase II requirements into a program that could eventually merge with the requirements of the state's Total Maximum Daily Load (TMDL) Program, and Stayton is in the Willamette Basin, which adopted a TMDL on September 21, 2006. Therefore Stayton has the potential of being required to meet the same conditions as an NPDES Phase II community.

Benefits of Implementing a Stormwater Management Program

A comprehensive municipal stormwater management program can provide a wide array of benefits for local jurisdictions and for the environment. A successful program offers benefits related to water quality, municipal operations, preservation of green space, and other aspects of a community's quality of life. Ultimately, such benefits can translate into economic benefits through more efficient operating practices, increased property values, and increased revenues from recreation and tourism.

Poorly managed stormwater can contribute high levels of pollutants into receiving rivers, lakes, streams and groundwater. Stormwater management programs recognize the potential impacts of unchecked stormwater runoff: accelerated stream flows, destruction of aquatic habitat, modified natural hydrologic patterns, and elevated pollutant concentrations. A stormwater management program that promotes or requires advanced land use practices can minimize negative chemical, physical, and biological impacts and produce water quality improvements over time.

A stormwater management program that improves water quality can help to meet regulatory water quality standards, which are the yardstick for assessing the need for pollution controls such as TMDLs or other water cleanup plans. Avoiding the need for such additional pollution controls or for limits on development can translate into cost savings for communities. Stormwater management programs can also

play an important role in reducing the number of impaired water bodies due to bacteria levels and reducing the need for additional expensive treatment technologies for drinking water supplies.

Stormwater management programs also can provide communities with a framework for efficient and cost-effective operational activities. Management practices that prevent pollutants from entering the storm sewer system reduce the need for costly system maintenance and repair activities. Through the reporting mechanisms required for stormwater management programs, communities establish the ability to track activities and expenditures related to stormwater management activities, thereby improving communication and coordination among responsible departments and with citizens.

Other benefits to consider include enhanced fishing and opportunities for recreation. Stormwater management helps to reduce pollutants that can harm important fish habitat and minimize the contaminants that make fish unsafe to eat—often the same pollutants that make swimming and boating unsafe. Stormwater quantity is often addressed through stormwater management techniques intended to improve water quality. Effective management techniques help to limit increases in impervious surface, thereby decreasing the quantity and velocity of stormwater runoff and minimizing flooding events. Stormwater management programs can help promote maintaining green spaces in the community, improve visual appearance of waterways, and promote cleaner, more attractive sites on land (e.g., better maintained parking lots, industrial sites, and municipal facilities).

REGULATORY FRAMEWORK

Background

The federal Clean Water Act is the primary federal law protecting water quality. The act requires that TMDLs be established when a water body does not meet water quality standards. The DEQ adopted a TMDL for the Willamette Basin in September 2006. The City of Stayton is within the Willamette Basin and has been identified as a "designated management agency" (DMA) in the Willamette River TMDL program. The TMDL includes limits for temperature, mercury, and bacteria.

The TMDL and Water Quality Management Plan (September 2006), states that DMAs are required to develop TMDL Implementation Plans to address TMDL allocations within their jurisdiction. TMDL Implementation Plans are due within 18 months from the date of the Notification Letters that ODEQ sends to DMAs, permitees, and other affected parties. The Notification Letters are to be sent out by ODEQ within 20 days of the TMDL being issued as an Order by ODEQ. The Implementation Plan due date is not dependent on USEPA's approval of the TMDL.

The required elements for TMDL implementation plans are defined in OAR 340-042-0080(3). required to fulfill the following objectives:

- Develop and implement best management practices (BMPs) or other management strategies to achieve TMDL load allocations.
- Develop a timeline for implementation and a schedule for completing measurable milestones.
- Develop a monitoring plan to determine whether:
  - BMPs are being implemented
  - Individual BMPs are effective
  - TMDL load allocations are being met

  - Water quality criteria are being met.
- Evidence of compliance with applicable statewide land use requirements.

DMAs also will have to include a stormwater management component in their TMDL Implementation Plans. DMAs with a population between 10,000 and 50,000 will have to address the six minimum control measures identified in the NPDES Phase II program; DMAs with a population less than 10,000 are expected to give considerations to any of the measures that are relevant. Therefore, Stayton has the potential of being required to meet the same conditions of a Phase II community.

Endangered Species Act

The Federal Endangered Species Act (ESA) was enacted in 1973 to protect threatened and endangered species. In 1987 the State of Oregon enacted the Oregon Endangered Species Act (ESA). The Willamette River provides habitat for steelhead and chinook salmon that are listed under both the Oregon and federal ESA. As the City's stormwater projects and policies have impacts on the Willamette River, the City should protect itself from potential legal action by working to ensure that its stormwater does not adversely affect the river's water quality. The City is directly regulated by the ESA through the review and permitting of in-stream construction project.

NPDES Permit Program

The federal Clean Water Act includes the NPDES permit program. Point source discharges to waters of the U.S., including stormwater and wastewater discharges, are regulated through NPDES permits issued by the U.S. Environmental Protection Agency (EPA) or by delegated states. In Oregon, NPDES permits are issued and implemented by the DEQ. The Water Pollution Control Act (Oregon Revised Statue (ORS) 468B) is the primary Oregon State law protecting water quality.

DEQ combines the federal NPDES regulations with pertinent state regulations and issues combined permits that regulate discharges to waters of the U.S. and waters of the state. These permits are designed to meet NPDES permit requirements and state law under the Water Pollution Control Act. "Waters of the state" include lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Pacific Ocean within the territorial limits of the State of Oregon and all other bodies of surface or underground waters, natural or artificial, inland or coastal, fresh or salt, public or private (except private waters which do not combine with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction.

The stormwater portion of the federal NPDES regulations has been implemented in two phases. Phase I addressed stormwater discharges by large and medium municipal separate storm sewer systems (MS4s) and certain industrial activities, including construction sites disturbing more than 5 acres. The term "separate" means that wastewater such as sewage is not combined with stormwater runoff. The Phase I stormwater regulations were published in 1990. Phase II addressed MS4s in smaller municipalities and construction sites disturbing between 1 and 5 acres; those regulations were adopted in 1999.

Phase I NPDES Permit Jurisdictions in Oregon

In Oregon, the DEQ has issued NPDES Phase I permits to regulate the discharges of stormwater from the MS4s operated by the following jurisdictions:

- Clean Water Services—Many jurisdictions in Washington County are covered by this permit
- City of Eugene

- City of Gresham—Including the City of Fairview and a portion of Multnomah County
- City of Portland—Including the Port of Portland and a portion of Multnomah County
- City of Salem
- Clackamas County SD No. 1—Including the following jurisdictions:
  - Clackamas County
  - City of Gladstone
  - City of Happy Valley
  - City of Johnson City
  - City of Lake Oswego
  - City of Milwaukie
  - City of Oregon City
  - City of River Grove
  - City of West Linn
  - City of Wilsonville
  - Oak Lodge Sanitary District

These Phase I jurisdictions were originally permitted in 1995, except for Salem, which was permitted in 1997. The Oregon Department of Transportation (ODOT) is also a Phase I municipal stormwater permittee for its stormwater discharges within the jurisdictions of the above cities and counties. Initially, ODOT was a co-permittee on all the Phase I permits, but DEQ issued ODOT a separate permit in 2000.

Phase II NPDES Permit

Affected Jurisdictions

Cities and counties in Oregon were required to apply for NPDES Phase II stormwater permit coverage if they meet all of the following conditions:

- Own and operate a municipal separate storm sewer system
- Discharge from the MS4 to surface waters
- Are within a census-defined urbanized area or are otherwise designated by DEQ.

The Phase II stormwater regulations apply only to discharges to surface waters. Communities that do not discharge to surface waters are not required to apply for NPDES stormwater permits.

The cities and counties listed below meet the three conditions above and are regulated under the NPDES Phase II program:

- City of Ashland
- City of Bend
- City of Central Point
- City of Philomath
- City of Phoenix
- City of Springfield
- City of Wood Village
- Benton County
- Jackson County

- City of Corvallis
- City of Keizer
- City of Medford
- City of Talent
- City of Troutdale
- City of Turner
- Lane County
- Marion County
- Polk County

General Requirements

The Phase II stormwater regulations address runoff from the urban areas of the cities and counties listed above. If runoff from agricultural land is discharging to a municipal storm drain system and contributing to a water quality problem, then the community should work to resolve those discharges.

DEQ requires Phase II municipalities to adopt ordinances and implement minimum measures and BMPs equivalent to those in the federal guidance and in DEQ's *Internal Management Directive—Phase II MS4 General Permit: Storm Water Management Program Plan Framework* (June 2003). Under the Phase II rules, municipalities may be subject not only to the requirements of MS4 owners and operators, but also to two other components of the federal NPDES stormwater program, also delegated to DEQ for implementation:

- The Industrial Stormwater General Permit as an operator of regulated industrial activity
- The Construction Stormwater General Permit as an operator of regulated construction activity disturbing more than 1 acre of land disturbed.

Each of the three components of the NPDES stormwater program (municipal, industrial and construction) has its own requirements and permits.

Industrial Stormwater General Permit (1200-Z; NPDES Permit for Stormwater Discharges Associated With Industrial Activities)

Businesses subject to the Industrial Stormwater General Permit have to prepare and implement a Stormwater Pollution Prevention Plan in accordance with the terms of that permit. The general permit (first issued in 1992, reissued in 1997 in the form of a 1200-Z permit, and again reissued in 2002) requires a description and implementation of operational source control BMPs and structural source control BMPs as applicable to their industrial activity. Erosion and sediment control (ESC) BMPs, flow control BMPs, and treatment BMPs are required if necessary to address an erosion, flow, or pollution problem.

Municipalities with industrial facilities and activities are also required to apply for the 1200-Z Industrial Permits. Under NPDES Phase II, a permitted small MS4 should probably apply for the 1200-Z permit, but its owner could designate those facilities to be covered under the "Municipal Operations" section of its plan with the DEQ's approval.

Construction Stormwater General Permit (1200-C; NPDES General Permit for Stormwater Discharges Associated With Construction Activity)

Operators of construction activities are required to seek coverage under the NPDES 1200-C general permit if the activity results in the disturbance (including clearing, grading, and excavation activities) of 1 acre or more, or if the activity is part of a "larger common plan of development or sale" with a planned disturbance of 1 acre or more and has a discharge of stormwater to a surface water and/or to a storm

drain used to convey water to a stream, lake, or wetland. Construction projects that disturb 1 or more acres are subject to three major requirements:

- Submit an NPDES 1200-C permit application, along with a Land Use Compatibility Statement signed by the local land-use authority (county or city planning department) prior to the construction start.
- Develop, submit, and fully implement an erosion and sediment control plan that is approved by DEQ or DEQ agent prior to initiating any on-site activities. This plan specifies the measures that will be put in place to prevent and/or control erosion and sediment runoff.
- Submit a Notice of Termination when the following criteria have been met: final stabilization of the site has been achieved as defined in the permit, all temporary erosion and sediment controls have been removed, and no potential remains for construction-related sediment discharge to surface waters.

Jurisdictions can implement the state's 1200-C permit program locally, by Memorandum of Agreement, through coordination with the Oregon DEQ. DEQ completed a *Statewide Erosion Prevention and Sediment Control Manual* and related *Inspection Guidance Booklet* for use by the construction industry and state and local inspectors in April 2005.

Underground Injection Control Program

One of the provisions of the federal Safe Drinking Water Act is to protect underground sources of drinking water (USDW). The Underground Injection Control (UIC) Program was established to protect USDW by regulating the discharges of fluids into the subsurface by underground injection wells. The federal UIC program was enacted in 1974, and is administered under 40 Code of Federal Regulations (CFR) part 144. The DEQ was delegated by the EPA in 1984 to oversee this program in Oregon, and was re-authorized in 1991. The DEQ regulates this program under Oregon Administrative Rules (OAR) Chapter 340, Division 44. The intent of the UIC program is to protect groundwater aquifers, primarily used for drinking water, from contamination. All groundwater aquifers in Oregon are considered suitable as drinking water.

Subsurface infiltration systems, such as drywells, are classified as Class V injection wells in the EPA's federal UIC program. The two requirements of the UIC program are as follows:

- A non-endangerment performance standard must be met, prohibiting discharges that allow movement of fluids containing contaminants into potential underground sources of drinking water.
- All UIC facility owners/operators must provide inventory information by registering the facilities.

Under the federal UIC regulations, the definition of an underground injection well is a bored, drilled, or driven shaft whose depth is greater than the largest surface dimension; a dug hole whose depth is greater than the largest surface dimension; an improved sinkhole; or a subsurface fluid distribution system that includes an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground. Examples of a UIC well or a subsurface infiltration system are drywells, drain fields, pipe or French drains, and other similar devices that discharge to ground.

OTHER RELATED TOPICS FOR NPDES PHASE II

Common Terms

The following terms have specific definitions for use in discussions of NPDES Phase II permitting:

- A **Municipal Separate Storm Sewer System** (MS4) means a conveyance or system of conveyances, including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, storm drain pipes, subsurface infiltration systems (drywells and infiltration trenches), detention systems, and stormwater quality facilities.
- An **operator** of an MS4 can be a town, city or county, the Oregon Department of Transportation, a tribe, or a special district (drainage improvement district, flood control district, etc.) and may include state-owned facilities (universities, prisons, hospitals, etc.).
- A **combined sewer** is a sewer system designed to convey commingled wastewater and stormwater runoff to a wastewater treatment plant. Where treatment plant or pipe capacity is inadequate during wet weather, the excess combined sewage discharges from the system at designated outfalls (termed combined sewer overflows).
- **Regulated small MS4s** are defined as all small MS4s located in "urbanized areas" as defined by the Bureau of the Census, and small MS4s located outside of a urbanized areas that are designated by NPDES permitting authorities. Only regulated small MS4s need to apply for a Phase II permit.

Urbanized Areas in Oregon and the Phase II NPDES Municipal Stormwater Permit

An urbanized area is a land area composed of one or more central places and the adjacent surrounding area (urban fringe) that together have a residential population of at least 50,000 and a density of at least 1,000 people per square mile. MS4s in other areas may be designated as needing a permit based on application of criteria to be developed by DEQ. The criteria must evaluate whether stormwater discharges result in or have the potential to result in exceedances of water quality standards, including impairment of designated uses, or other significant water quality impacts, including adverse habitat and biological impacts. In Oregon, there are six census-defined urbanized areas:

- Bend Urbanized Area
- Corvallis Urbanized Area
- Eugene Urbanized Area
- Medford Urbanized Area
- Portland Urbanized Area
- Salem Urbanized Area.

The federal Phase II stormwater regulations require the stormwater program to be implemented only within these urbanized areas. However, these urbanized areas do not generally follow city and county boundaries. Phase II communities, for ease of implementation, may want to implement the program jurisdiction-wide instead of only within the urbanized areas. For Phase II counties where only a small portion of the county is in the urbanized area, the county may want to implement the program within the urban growth boundary or other planning boundary or similar urban area. When identifying the area of

implementation of their stormwater programs, communities may want to consider areas of significant development and industrial or commercial land uses that are outside of the urbanized area and discharge to their storm drain system.

DEQ, in coordination with local governments, considered the following when identifying the coverage area for the Phase II permit:

- **Where the urbanized area does not follow city/county boundaries**. The census defined urbanized area does not follow city and county boundaries.
- **Where the urbanized area includes a combined sewer area.** Some areas of Oregon contain combined sewer systems. Areas drained by combined sewers are not addressed in the Phase II regulations, but are instead addressed by the Combined Sewer Overflow Reduction Program. Cities and counties served by combined sewers should coordinate the development and implementation of these programs and practices jurisdiction-wide.
- **Where parts of the urbanized area discharge to ground through subsurface infiltration systems or do not drain to waters of the U.S.** NPDES municipal stormwater permits are not required in areas that do not drain to waters of the U.S. For cities or counties with numerous drywells and outfalls to surface waters, this could result in a patchwork program where Phase II requirements apply in some areas or to some stormwater discharges, but not others. The state's Water Pollution Control Act (ORS 468B) requires that discharges to all waters of the state be managed to protect water quality. The state's UIC rule will require cities and counties to manage stormwater discharges to UIC wells. Stormwater management programs are developed in compliance with the Phase II Municipal Stormwater Permit.
- **Where the urbanized area is only a small portion of a jurisdiction.** This especially applies to counties, where the urbanized areas are generally only a small portion of their jurisdictions.
- **Where the urban growth boundary is located with respect to the census-defined urbanized area.** DEQ is considering whether coverage under the Phase II municipal stormwater permit should be based on the Urban Growth Boundaries established by cities and counties under the state Growth Management Act. A coincident boundary may ease program implementation in the long run.
- **Where there are unincorporated islands within a city.** The Phase II stormwater regulations apply to all storm drain systems within urbanized areas. Where a city has an unincorporated island within the city boundary, this unincorporated island is subject to the permit, but responsibility for compliance falls to the county. These unincorporated islands present an excellent opportunity for city and county agencies to cooperate on developing a joint stormwater program.

Jurisdictions Not Covered by NPDES Phase II

In Oregon, 25 small MS4s within the census-defined urbanized areas designated by EPA in the 2000 Census were mandated to be evaluated for Phase II coverage. DEQ performed an analysis and designated 18 municipalities for coverage. From the initial list, DEQ determined that the following municipalities are exempt at this time:

- Adair Village
- Rainier

- Coburg
- Jacksonville
- Maywood Park
- Columbia County
- Deschutes County

Generally, these jurisdictions either have less than 1,000 people in the urbanized area served by MS4s, or they do not discharge to surface water.

The following jurisdictions outside of census-defined urbanized areas were considered for coverage by DEQ but were not designated at this time:

- Albany
- Canby
- Coos Bay
- Dallas
- Grants Pass
- Hermiston
- Klamath Falls
- La Grande
- Lebanon
- McMinnville
- Newberg
- Ontario
- Pendleton
- Redmond
- Roseburg
- St. Helens
- The Dalles
- Woodburn

Municipalities not subject to NPDES stormwater municipal permits are encouraged to adopt stormwater programs at least equivalent to the program components. Adoption of such a program is voluntary. Such municipalities would benefit by helping to protect local ground and surface water sources from stormwater pollution, reducing potential flooding concerns, and ensuring that their storm drain system is properly maintained. Such programs would include adoption of ordinances and implementation of minimum measures, including BMPs.

Any of the above listed jurisdictions can be designated by DEQ, should their status change. One of the most likely criteria for designation will result from a TMDL evaluation that indicates stormwater is a significant contributor to water quality pollution in a receiving water.

What Does Phase II Require

The Phase II stormwater regulations specify that an operator of an MS4 must implement a program of stormwater management activities to protect water quality. The program must at least address the following minimum requirements:

1. **Public education and outreach**—Develop and distribute educational materials and conduct public outreach aimed at informing citizens about the impacts of polluted stormwater as well as ways to minimize their contribution to pollution.
2. **Public involvement and participation**—Involve the public in stormwater management program development and implementation.
3. **Illicit discharge detection and elimination**—Develop and implement a program of detecting and eliminating illicit discharges to the storm drain system. This includes storm system mapping, dry weather sampling, and citizen information activities.
4. **Construction site stormwater runoff control**—Develop, implement, and enforce a program and standards to control or prevent erosion and sediment discharges from

construction sites that disturb 1 or more acres of land. This includes preparation of a construction site erosion and sediment control plan.

5. **Post-construction stormwater management**—Develop, implement, and enforce a program and standards to control or prevent discharge of polluted runoff from new development and redeveloped sites. This can include structural treatment and detention systems as well as resource protection measures (wetland protection, habitat protection, etc.) and pollution prevention planning.
6. **Pollution prevention, or "good housekeeping," for municipal operations**—Develop, implement, and enforce a program to control or prevent the discharge of polluted runoff from municipal operations (road maintenance, vegetation management, storm drain maintenance, etc.).
7. **Compliance with more stringent conditions**—Measures beyond the six above may be needed to achieve TMDLs or other cleanup plans to meet federal Clean Water Act requirements to restore beneficial uses of impaired water bodies.
8. **Evaluation and assessment**—Evaluate the program's compliance with permit conditions and the effectiveness and appropriateness of the identified BMPs. Keep records and report to DEQ any changes in activities resulting from program evaluation and assessment.

The federal regulations do not require Phase II jurisdictions to inspect industrial sites. DEQ is responsible for inspecting industrial sites to ensure compliance with the statewide Industrial Stormwater General Permits. Phase II communities will still be expected to investigate reports of illicit discharges to their storm drain systems at industrial sites, review erosion and sediment control plans for construction of new industrial sites, and implement other aspects of their stormwater management programs that are generally applicable jurisdiction-wide.

Development of a Phase II-compliant stormwater management program may necessitate additional staff, office space, equipment, and funding.

As a practical matter, implementing a stormwater management program to address the minimum requirements of a NPDES permit may require that operators of small MS4s do the following:

- Integrate a stormwater management program into their organizational structure.
- Hire additional staff to carry out the work (public involvement and education, plan review, inspection and enforcement, maintenance, planning, complaint response, management, etc.).
- Find additional office space for staff.
- Obtain additional office, field, and maintenance equipment.
- Develop and adopt ongoing funding methods.
- Develop and adopt various legal ordinances.
- Conduct ongoing stormwater and surface water planning efforts.

Appendix D.3

NPDES Plan

KELLER associates

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Technical Memorandum

City of Stayton
STORMWATER NPDES
PHASE II PROGRAM PLAN

January 5, 2007

1.0 INTRODUCTION

This Stormwater NPDES Phase II Program Plan for the City of Stayton, Oregon, has been developed to address the Municipal Separate Storm Sewer System (MS4) permit requirements of the National Pollutant Discharge Elimination System (NPDES). The MS4 program for small jurisdictions is often called NPDES Phase II. The program described in this document is outlined for a 5-year period, since that is the standard length of a NPDES permit term. Although the City of Stayton is currently not required to meet NPDES Phase II requirements, the City is addressing several of these issues as part of the overall stormwater master plan effort. This program's approach will meet the requirements of the Willamette River TMDL program where the City is identified as a Designated Management Agency (DMA).

This Plan is arranged by the six minimum measures that were identified in the Federal Register. At the beginning of each section is a summary table listing each proposed activity (or BMP) associated with the measure addressed in that section. The five columns indicate which years (during the 5-year permit period) that the activity is anticipated to be performed by the City, working either jointly or independently, as applicable. The summary tables are followed by descriptions of schedules, measurable goals, responsible parties, and other implementation issues for each activity.

The measurable goals proposed for each activity were established through various means. Generally, they represent what seemed reasonable for each situation, based on past experience and common practices for stormwater management. Certain activities have precedent activities, so those are scheduled accordingly. From a practical sense, not all activities can be performed in Year 1, so a conscientious attempt was made to spread them out over a 5-year period.

A NPDES permit would require reporting of measurable goals and implementation schedule, which is also a requirement of the DMA's under the TMDL program.

2.0 STORMWATER PUBLIC EDUCATION PROGRAM

Stayton may wish to maximize the use of regional information and publications to the extent practical. This would include assisting with the circulation of literature developed by DEQ, EPA, the North Santiam Watershed Council, and others.

In addition to preparing the 5-year program, Stayton could implement a program to educate the public about possible regional coordination efforts and what the NPDES Phase II and the TMDL programs mean to the community. This work could include conducting open houses, preparing brochures, and making presentations to City Council. The following table describes efforts that could be undertaken and planned for the 5-year program.

TABLE 2-1
STORMWATER PUBLIC EDUCATION PROGRAM

BMP Activity / Description	Activity Year 1	2	3	4	5
Stormwater Education & Outreach Strategy	√	–	√	–	–
Stormwater Brochure for the General Public	–	–	√	–	–
Targeted Stormwater Brochures	–	√	–	√	–
Storm Drain Stenciling	√	√	√	√	√
Water Quality Education with Schools	–	√	–	√	–
Volunteer Groups on Stormwater Education	–	√	–	√	–
Stormwater Speakers Bureau	–	–	–	–	–
Stormwater Public Service Announcements	–	–	√	–	–
Stormwater Display	–	√	–	–	–
Stormwater Web Site	–	–	–	–	–

√	Activity scheduled for year	–	No activity scheduled for year

2.1 Develop a Stormwater Education and Outreach Strategy

Develop and implement a stormwater education and outreach strategy that examines target audiences. Include in the strategy information on the hazards associated with illicit discharges and improper disposal of waste.

Description: The stormwater outreach strategy is a required BMP under the NPDES Phase II permit. An effective education and outreach program begins with a comprehensive education and outreach strategy. The strategy focuses on identifying target audiences, including what they value and how they communicate. This information directly relates to determining the other education and outreach BMPs that are most appropriate for target audiences.

- Step 1. Characterize Target Audiences: Specific groups within the community may have the potential to contribute pollutants to stormwater. If so, document

characteristics about these groups for use in developing and distributing educational materials.

- Step 2. Develop Education and Outreach Strategy: Using information about the storm drainage system and target audiences, develop an education and outreach strategy to help implement the overall program. The strategy identifies a variety of information, including the driving force (i.e., key problems caused by stormwater associated with the target audience); the key message(s); the objective (e.g., raise awareness, educate, or motivate action); the format for delivering the message; the distribution method; and the responsible parties and/or partners.

Potential Action Plan and Schedule: The Potential Action Plan for this activity is to meet with the North Santiam Watershed Council to discuss current public outreach activities and to identify potential audiences, methods to reach these audiences and a schedule to implement these activities.

Measurable Goal: Every six months City staff will meet with staff of the North Santiam Watershed Council to discuss Public Education and Outreach. This will determine the effectiveness of the existing programs and potential future endeavourers. If it is determined minor modifications to the program are required to reach a larger audience these will be outlined in the annual reporting.

2.2 Stormwater Brochure for the General Public

Develop and distribute a brochure or equivalent program to inform the general public about stormwater issues and of the hazards associated with illicit discharges and improper disposal of waste.

Description: Develop and distribute a general brochure on stormwater. The purpose of this brochure is to address how stormwater can impact water quality and the steps that people can take to reduce stormwater pollution (e.g., do not dump to storm drains). One element of the illicit discharge detection and elimination minimum measure is to "inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste." This BMP fulfills this element.

There are many opportunities to "piggyback" the distribution of educational materials onto the distribution of others such as newspapers, newsletters, and community events. Take advantage of these existing communication channels for distributing materials and messages in an effective and cost-efficient manner.

Exposing target audiences to a message on a regular basis can raise awareness. A combination of formats and distribution channels to reach each target audience is beneficial. A feedback mechanism can be developed for evaluating the effectiveness of the materials and the changes in target audiences' level of awareness regarding stormwater.

Potential Action Plan and Schedule: The plan is to send out one general stormwater brochure in the third year of the program.

Measurable Goal: The measurable goal of this activity is the number or percentage of residents and business contacted with the brochure.

2.3 Targeted Stormwater Brochures

Develop and distribute stormwater brochures that address a variety of different target audiences.

Description: Brochures targeted and written specifically for the audience are often more effective than general brochures. The stormwater education and outreach strategy will provide direction on target audiences and issues to consider when developing targeted brochures.

Target audiences include residents, businesses, industries, and developers. Consider addressing topics such as pet waste management, pollution prevention tips for landscaping, proper disposal of household hazardous waste, pesticide use, do-it-yourself auto maintenance, car washing, and/or pavement deicing.

Potential Action Plan and Schedule: Within the second year Stayton will develop a targeted brochure for erosion control (see Section 5.6). The brochure will discuss the need for erosion control along within general prevention and where more information can be obtained. The brochure will be included in all building permit application packages.

Develop second brochure by the fourth year of the program. Other targeted brochures might include homeowners along creek corridors, or brochures describing new development requirements as part of this program. Targeted groups to be determined in year 1 as part of the Outreach Strategy.

Measurable Goal: Erosion Control targeted brochure included in all building permits by year 2.

2.4 Storm Drain Stenciling

Plan and conduct storm drain stenciling projects using “Do Not Dump – Drains to Stream” or an equivalent message on storm drain inlets draining to the system.

Description: Stenciling storm drains with messages such as “Do Not Dump – Drains to Stream” or “Do Not Dump – Drains to Ground Water” have proven very effective in many jurisdictions. Some residents still do not know that material placed in storm drains is not treated at a wastewater treatment plant before reaching a river or infiltrating into ground water. These permanent messages on storm drains serve as constant reminders and teaching tools for everyone who sees them.

There are several options to consider in terms of what type of stencils to use and how to get the job done. First is to consider enlisting the aid of volunteer organizations. Second is to decide on the method of applying the messages. To apply the “no dumping” messages, use either actual stencils that require paint or signs and emblems out of plastic and metal that permanently affix. Labor for stenciling can come from either municipal employees or volunteers. Set a goal to complete a certain amount of storm drain stenciling by the end of the first permit term. Using the storm sewer system map completed for the Illicit Discharge Detection and Elimination minimum measure (described in Section 4), prioritize storm drain inlets according to potential risk (e.g., inlets with a history of illegal dumping; inlets located near industries with outdoor, uncovered operations; and inlets located near areas with high rates of development) and begin stenciling projects in those areas.

Potential Action Plan and Schedule: The City may consider a program to stencil storm drains and catch basins which have not been stenciled. City Staff will investigate the wear of the stenciling in year 3 and 5 to determine if the storm drains will need repainting. All storm drains of new development and road improvement projects will be painted following project completion. This project could be listed as a service project available for community service organizations.

Measurable Goal: Measurable goal will be to monitor stencils for wear and to include storm drain stenciling in the City final inspection for new development.

2.5 Promote Water Quality Education with School Districts

Contact school districts to discuss opportunities to integrate water quality educational materials into the classroom and provide educational materials when requested by schools. This effort might already be preformed by the North Santiam Watershed Council and therefore should be discussed at the strategy meeting.

Description: For this BMP, contact all schools districts within the storm drain system and offer to distribute appropriate water quality educational materials. If feasible, offer staff from a department involved in stormwater management to teach some of the material or organize alternative educational efforts such as tours of wastewater treatment plants or stream restoration visits.

The Oregon Department of Environmental Quality lists Classroom Curriculum Guides (K-12) that could be distributed to local schools. See the web site http://www.deq.state.or.us/programs/education.htm for more information. DEQ also holds workshops for teachers on Project WET, Water Education for Teachers. Additional information can be found on DEQ's web site.

Potential Action Plan and Schedule: The City of Stayton may wish to coordinate and promote stormwater Education. This effort could be lead by the Watershed Council or the City and include meetings with educators to determine how City Staff can provide educational instruction and material to local educators. The coordination will include working with local organizations and school districts to develop a water quality education program. Specific guidelines can be obtained from other resources throughout the region. Details of how the effort can assist educators will be determined based on the initial meetings with the educators. The effort will start approaching school districts and educators in year 2 of the program to determine the best methods to coordinate efforts.

Measurable Goal: Contact the school district within the storm drain system boundary by the end of permit year 2. Measurable goals for the detailed education will be based on the approach chosen to assist educators. The goals and achievements will be presented in the annual reporting.

2.6 Work with Volunteer Groups on Stormwater Education Projects

Contact volunteer organizations to discuss opportunities to integrate stormwater into existing education projects. This should include the Watershed Council and other groups within the area.

Description: Many volunteer organizations within the storm drainage system may already conduct water quality related educational programs. Where these organizations exist, they may be willing to incorporate stormwater issues into their programs and activities to help meet this minimum measure.

Begin by researching the various volunteer programs and organizations that focus on the boundaries of the storm drainage system and/or the watershed and identify ways to integrate stormwater issues into these existing volunteer opportunities.

Potential Action Plan and Schedule: Stayton may consider working with local volunteer organizations to discuss opportunities to integrate stormwater/water quality information into existing education projects.

Adopt a Street Program: This program allows businesses, service clubs, schools, and organizations to adopt an arterial or collector street. The groups is asked to adopt the street for at least 1 year and conduct litter clean ups at least every 3 months. Individual residents, neighborhoods, or families can also adopt streets in their neighborhood. They are asked to adopt the street for at least a 1 year period and clean it on an as needed basis.

Storm Drain Stenciling Program: The City might supply all equipment for the stenciling program for participants or other volunteers to stencil the words "Dump No Waste—Drains to Streams" on storm drains.

Measurable Goal: Assist any groups actively contacting the City. This could be an ongoing activity with groups that express interest. In years 2 and 4 actively contact at least 2 volunteer organizations per year to discuss and promote stormwater education.

2.7 Develop a Stormwater Speakers Bureau

Develop and promote a stormwater speakers bureau that gives presentations on stormwater issues throughout the community. The Watershed Council may already have qualified people to make these presentations.

Description: Recruiting a team of stormwater management advocates from target audiences is one way to educate stakeholders and to distribute stormwater educational messages at a low-cost. Speakers bureaus are an effective way to get out information on stormwater management and have the message come from a representative of each target audience. All that is needed to implement this BMP are presentation materials on stormwater management and a group of willing volunteers who like to speak in public.

Potential Action Plan and Schedule: This activity should be discussed with the Watershed Council to determine the best qualified residents or staff to go to meetings to discuss Stormwater Quality programs and activities.

Measurable Goal: Keep records of any stormwater presentations and the number of attendees or number of times the program was repeated.

2.8 Create Stormwater Public Service Announcements

Broadcast stormwater public service announcements (PSAs) through newspapers, television, or radio and run the announcements at appropriate frequent intervals to ensure target audiences are exposed to the message.

Description: Most people within communities receive their information from mass media sources such as newspapers, television, and radio. While these forms of outreach tend to be more expensive than printed materials, they can reach a wide audience and have a stronger, more lasting impact.

Design public service announcements (PSAs) for mass media sources such as newspaper, television, or radio. To have an impact, audiences need exposure to PSAs over a long-period of time and at regular intervals. Many communities have already designed and used PSAs related to stormwater and make these PSAs available to other communities to use either for free or at a minimal cost.

Potential Action Plan and Schedule: Working with the Watershed Council, DEQ or others a public announcement should be attempted in the third year of the program. This could be radio or news print and could use material developed by others.

Measurable Goal: The number of Public Service Announcements will be kept over the first five years.

2.9 Design a Stormwater Display

Display a stormwater exhibit at various community locations and events (e.g., county fairs, city events).

Description: Buildings and events that have regular traffic and/or attract a large number of people provide an opportunity for stormwater education. Free-standing educational displays are intended to communicate information in an easy-to-understand format using photographs, maps, and hands-on activities.

In order to design and develop an educational display on stormwater issues, include messages for members of each target audience, provide information on stormwater problems and solutions, and use a combination of images and text to convey information. In addition to developing the display, use the information contained in the education and outreach strategy (BMP 2A) to identify the most effective places and/or events to set-up the display.

Potential Action Plan and Schedule: A stormwater display will be developed by the second year of the program to be shown on community events.

Measurable Goal: Track the number of events and attendance the display is shown.

2.10 Create a Stormwater Web Site

Create a stormwater website that contains educational information for a variety of target audiences.

Description: Design and develop a stormwater website that contains educational information on stormwater and information on the jurisdiction's stormwater program. Include the website address on other forms of outreach, such as brochures and displays, to ensure that the community knows where to find additional information about stormwater.

Potential Action Plan and Schedule: Nothing is scheduled for this activity for the first 5 years of the program. This activity is listed as an alternate if others activities are not successful or not implemented.

Measurable Goal: A measurable goal for this activity would be the development of a web site or a section of the City's overall web site.

3.0 STORMWATER PUBLIC INVOLVEMENT AND PARTICIPATION PROGRAM

Stayton may wish to maximize the use of regional public involvement activities to the extent practical. This would include coordinating with activities performed by DEQ, EPA, the North Santiam Watershed Council, and others.

Stayton could implement a program to involve the public in local and regional coordination efforts. This work could include conducting public meetings, distributing news releases, and forming a stormwater group to advise staff and the City Council. The following table describes efforts that could be undertaken and planned for the 5-year program.

TABLE 3-1
STORMWATER PUBLIC INVOLVEMENT AND PARTICIPATION PROGRAM

	Permit Year				
BMP Activity / Description	1	2	3	4	5
Public Review/ Public Meetings	√	–	√	–	–
Distribute News Releases	√	–	–	–	–
Stormwater Advisory Group	√	√	√	√	√

√	Activity scheduled for year	–	No activity scheduled for year

3.1 Public Review/Public Meetings

Hold public meetings and solicit public review of the stormwater management plan.

Description: Follow all local and state public notice requirements to ensure that the public has an opportunity to participate in the program. Local public notice requirements vary, but will probably consist of public meetings and publishing notices in local newspapers.

Potential Action Plan and Schedule: The City of Stayton will investigate methods to encourage the involvement of the public in stormwater activities. This effort will continue throughout the 5-year program. The program will be developed to allow public comment on stormwater programs and projects.

Once the stormwater management plan is completed, Stayton will hold public meetings to solicit public review of the plan.

The effort for public review and public meetings will continue throughout the 5-year program however attempts should be made to have a public meeting in the first and third year of the program.

Measurable Goal: Hold at least two public meeting and publish at least two public notices during the 5-year program.

3.2 Distribute News Releases

Develop a news release for local newspapers in order to solicit interest to cover the new stormwater program as a feature story.

Description: To help encourage additional local coverage on the development of the stormwater program, create and distribute a new release for use by local papers. Include in the news release an overview of the new stormwater program, activities that will be conducted, and how the public can obtain more information.

Potential Action Plan and Schedule: The distribution of news releases will be provided when the local press is available and interested in stormwater topics. No schedule for this has been developed and opportunities will depend on the news agencies' interest in stormwater activities.

Measurable Goal: At least one news release story on the jurisdictions stormwater program over the first five year program.

3.3 Stakeholder Advisory Group

Hold meetings with a stakeholder advisory group for stormwater issues.

Description: An advisory group could be formed with representatives from several City departments and members of various organizations in the City and beyond. This group would address issues pertaining to the stormwater program and provide guidance for planning, engineering, construction and operation activities.

Potential Action Plan and Schedule: The group should set a schedule for meeting and every six months or every year.

Measurable Goal: Dates and attendance will be kept for each meeting. A summary of topics discussed and key decisions will be kept and submitted as part of the annual report.

4.0 ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

In order to meet regulations under 40CFR122.34(b)(3), an Illicit Discharge Detection and Elimination Program will be developed for the City of Stayton. The following table describes efforts that could be undertaken and planned for the 5-year program.

TABLE 4-1
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

BMP Activity / Description	Permit Year 1	2	3	4	5
Storm Sewer System Map	√	–	–	–	–
Ordinance to Prohibit Non-Stormwater Discharges	√	√	–	–	–
Detect and Address Non-Stormwater Discharges	–	–	√	–	√
Conduct Field Inspections	–	√	√	√	√
Spill Response Plan (create new plans or review and update existing plans)	–	√	–	–	–
Plan for Enforcement Actions	–	√	–	–	–
Train Municipal Staff on Spill and Illicit Discharge BMPs	–	√	–	–	√

√	Activity scheduled for year	–	No activity scheduled for year

In addition to the following required best management practices (BMPs), brochures, including information about illicit discharges will be created for the general public as a part of the Public Education requirements.

4.1 Storm Sewer System Map

Create a storm sewer system map showing all known storm drain outfalls to receiving waters.

Description: If one does not already exist, a storm sewer system map showing, at a minimum, locations of all outfalls and the names and locations of all waters that receive a discharge from those outfalls is needed. The mapping of storm sewer pipe or storm drain inlet locations is not required, although it is probably desirable for most cities in the long-term to assist with maintenance

Potential Action Plan and Schedule: A storm sewer system map is being created as part of the Master Plan effort and therefore this effort is due to be completed in the first year of the plan.

The storm sewer system map will be updated as a part of the Illicit Discharge Detection and Elimination activities and the Post-Construction program activities. As new development is permitted the drainage system will be added to the base map.

Measurable Goal: The storm sewer system map will be updated annually.

4.2 Ordinance to Prohibit Non-Stormwater Discharges

Develop and enforce an ordinance prohibiting illicit discharges and illegal dumping, and authorizing enforcement actions, including on private property.

Description: First, assess whether the required legal authority to prohibit non-stormwater discharges to the storm drainage system currently exists. Look to existing ordinances or municipal codes to identify this legal authority. If adequate legal authority prohibiting illicit discharges does not exist, an ordinance can be drafted.

A model ordinance includes authority for all three of the ordinances required by EPA's Phase II regulations: ordinances to control illicit discharges, construction site runoff, and post-construction runoff. It may be easier to combine all three ordinances into a single ordinance if legal authority does not currently exist.

Potential Action Plan and Schedule: If it is not already in place, the city may consider enacting a policy or code making it unlawful to deposit substances in the public drainage system that could cause damage to that system..

Measurable Goal: The measurable goal is to have ordinances in place to make it (1) unlawful to discharge pollutants to the storm system, (2) allow the City to investigate private property for illegal discharges, (3) allow the City to force private properties to make changes if illegal discharges are detected, (4) make it illegal for new development to construct illegal discharge connections.

4.3 Detect and Address Non-Stormwater Discharges

Develop an illicit discharge detection plan that includes, at a minimum, the following components: (1) Identification of priority areas for assessment, (2) Field assessment activities, (3) Routine schedule for system inspection, (4) Characterization of any discharges found, (5) Procedures to trace an illicit discharge, and (6) Procedures to remove an illicit discharge.

Description: The primary component of this minimum measure is to develop an illicit discharge detection plan to find, identify, and eliminate unknown pollutant discharges to the storm drainage system. The purpose of this plan is to identify priority areas within the storm drainage system that are believed to be more susceptible to illicit discharges, describe field assessment activities, determine when a discharge is found whether it is illicit, and describe procedures to trace the discharge back to its source and eliminate the discharge.

Potential Action Plan and Schedule: An Illicit Discharge Plan will be prepared by year 3 of the program. This will include a procedure for the inspection and detection of illicit discharges. The following components will be included in the plan:

1. Identification of priority areas for assessment
2. Field assessment activities
3. Routine schedule for system inspection
4. Characterization of any discharges found
5. Procedures to trace an illicit discharge
6. Procedures to remove an illicit discharge

The new stormwater ordinance discussed under Section 4.2 will provide the City with regulations to remove illicit discharges if detected.

After the program has been implemented for a year the overall plan will be reevaluated in year 5 to make minor modifications.

Measurable Goal: Develop plan by year 3 and evaluate plan in year 5.

4.4 Conduct Field Inspections

Visually inspect for illicit discharges during dry weather at all known outfalls that discharge to surface waters (in conjunction with the storm sewer system map).

Description: Using the plan and City maps, the City field staff will inspect outfalls for any signs of illicit discharges. Field inspection activities consist of visiting outfall locations using the system map and recording visual observations at each outfall within a priority area. For accessible outfalls, mark the outfall once it is located and complete a field inspection form. If an outfall is not accessible, field crews must use the system map and identify the nearest point to access the system. Locate the storm sewer manhole closest to the outfall and remove the cover to identify signs of dry-weather flow, such as odor or residue. City Staff will inspect outfalls and the drainage system to determine if they are functioning as designed.

Potential Action Plan and Schedule: This activity is simply implementing the Illicit Discharge Plan developed under Section 4.3 of this section. The plan will develop a schedule and reporting procedures to be used when conducting these inspections. At a minimum, each outfall shall be inspected on a 3-year rotation. Appropriate actions will be taken to determine the source of any illicit discharges found during the inspections.

Measurable Goal: The measurable goals for this activity should be developed as part of the Illicit Discharge Plan. Methods for measurement might be inspection of a percentage of the system each year.

4.5 Spill Response Plan

Develop and implement a spill response plan.

Description: A written spill response plan is needed to identify appropriate actions when a spill occurs. Include in the plan, for different kinds of spills, who should be contacted and what the municipality will do in response. The plan also needs to include recordkeeping and reporting requirements so that each spill, the response, and its outcome are tracked.

Potential Action Plan and Schedule: A Spill Response Plan would be prepared in year 2 of the program.

Measurable Goal: Implement the program by the end of permit year 2.

4.6 Plan for Enforcement Actions

Develop and implement an enforcement plan to ensure compliance with local ordinances. This enforcement plan will be used for illicit discharges, construction site discharges, and post-construction discharges.

Description: The enforcement plan developed for this BMP addresses how to handle non-compliance with local ordinances and discharges from illicit sources, construction sites, and post-construction BMPs. Develop the plan so that it is specific enough to give inspectors guidance on the typical penalty for each situation.

Potential Action Plan and Schedule: After discovering an Illicit Discharge, the City of Stayton will first attempt to work with the responsible party to eliminate the problem or to route the flow to the sanitary sewer, if allowable. The City may consider establishing a municipal code providing the ability for the city to fine a party on a daily basis for an infraction. The City can also work with the DEQ to eliminate spills and illicit discharges when discovered.

Measurable Goal: No measurable goal for this activity.

4.7 Train Municipal Staff on Spill and Illicit Discharge BMPs

Provide training or coordinate with existing training efforts to educate relevant staff on proper BMPs for spills and illicit discharges.

Description: Provide training to relevant municipal staff, such as field maintenance crews, illicit discharge inspectors, and other first responders, on the proper BMPs to use for spills and illicit discharges. Include in the training who to call for different types of spills.

This training could be combined with other training of municipal staff conducted in Section 7.

Potential Action Plan and Schedule: Once the above items are completed, relevant municipal staff will be trained on the proper BMPs to use for spill response and illicit discharge detection and removal. The staff training will occur in combination with training for Pollution Prevention. “Refresher” training will update staff on changes to the procedures as needed.

The training of staff will begin in year 2 with refresher courses and courses for new staff conducted in year 5 of the program. Selected staff will go to regional or statewide training classes and develop a program to train all staff within the City crews.

Measurable Goal: The number of staff time spent in class along with class subjects will be documented and reported annually.

5.0 CONSTRUCTION SITE STORMWATER RUNOFF CONTROL PROGRAM

In order to meet regulations under 40 CFR 122.34(b)(4), the City of Stayton will need to develop, implement, and enforce a program to reduce pollutants in any stormwater runoff from construction activities. The regulations covering this activity will need to be part of the overall City stormwater ordinance. The size of the construction activity covered by the ordinance will be determined during the ordinance development. Meetings with City Council however, will cover, at a minimum, construction activity of 1-acre or larger. The following table describes efforts that could be undertaken and planned for the 5-year program.

TABLE 5-1
CONSTRUCTION SITE STORMWATER RUNOFF CONTROL PROGRAM

BMP Activity / Description	Permit Year 1	2	3	4	5
Modify Erosion and Sediment Control Ordinance	–	√	–	–	–
Develop Erosion Control Manual (or adopt state or other manual)	–	√	–	–	–
Train Plan Reviewers and Field Inspectors	–	√	–	–	–
Training for Contractors and Developers		√	–	–	–
Review Site Plans for Erosion and Sediment (E&S) Controls	–	–	√	√	√
Receive Information from the Public	–	–	√	√	√
Inspect Construction Sites	–	–	√	√	√
Information Brochures for Contractors	–	√	–	–	–
Provide Information on Training for Construction Operators	–	√	–	–	–

√	Activity scheduled for year	–	No activity scheduled for year

5.1 Modify Erosion and Sediment Control Ordinance

For permits or authorizations issued by the jurisdiction for construction operators disturbing at least 1 acre, require through an ordinance, erosion and sediment controls in compliance with an adopted stormwater management *Manual* or other guidance document. Jurisdictions may, at their discretion, require erosion and sediment controls for smaller sites based on local conditions and needs.

Description: The 1994 Storm Design Standards has a section describing erosion control requirements however this section is limited to areas within the banks of a waterway. This standard requires updating to include referencing the need for developing an ordinance to allow the collection of permit applications and the issuing of permits. This will allow the City to administer the DEQ program. This ordinance typically requires construction operators to follow a guidance manual. An effective ordinance also

includes penalties to ensure compliance. At a minimum, this ordinance applies to all construction activity disturbing at least one (1) acre but can include single family construction. Incorporate these ordinance requirements into an existing grading permit process, requiring sites to submit erosion and sediment control plans and implement BMPs before a grading permit is issued.

Include in the local ordinance a requirement that construction sites comply with an adopted stormwater management *Manual*. Such a *Manual* could either be prepared locally, regionally, or statewide. Alternately, the Oregon DEQ has prepared a statewide *Erosion Prevention and Sediment Control Manual* for use by the construction industry and state and local inspectors. In any case, the details on the types of controls construction sites must implement should preferably be contained in the technical *Manual*, not in the ordinance. The State Building Code can also provide the legal authority, however, in most cases it is probably better to have the legal authority specified in the local municipal code.

Potential Action Plan and Schedule: Stayton will adopt a stormwater ordinance that will include illicit discharges, construction site runoff, and post construction runoff by year 2 of the program.

Stayton currently has design guidelines that include requirements for erosion and sediment control, however these guidelines are very brief (about one page of text). An expanded program should be developed to address new requirements of stormwater NPDES Phase II, or the state's manual, once available, could be used.

Measurable Goal: Adopt updated Ordinance and Design *Manual* by the end of program year 2.

5.2 Train Plan Reviewers and Field Inspectors

Provide training or coordinate with existing training efforts to educate plan reviewers and field inspectors in erosion and sediment control BMPs and requirements.

Description: Sections 5.3 and 5.5 describe the process to review site plans for erosion and sediment controls and inspect construction sites for proper BMP installation and maintenance. To help implement these activities, provide training to plan reviewers and field inspectors in developing and implementing an effective erosion and sediment control plan. This training can be developed in-house, or a variety of organizations offer training courses on construction site sediment and erosion control.

Potential Action Plan and Schedule: Once an ordinance is in place, Stayton will train city staff responsible for reviewing plans and inspecting construction sites to ensure that erosion and sediment control BMPs are properly installed and maintained. If possible, training will be coordinated with training on post-construction stormwater management. "Refresher" training will update staff on changes to the procedures as needed. Stayton may participate in a regional training program. This might include training programs by DEQ.

Train plan reviewers and field inspector by the end of program year 2.

Measurable Goal: The number of hours spent in class along with class subjects will be documented and reported annually.

5.3 Review Site Plans for Erosion and Sediment (E&S) Controls

Review stormwater site plans prior to construction to ensure that they include adequate E&S controls and post-construction controls. This review is conducted to determine compliance with local ordinances and

the adopted stormwater management *Manual*. Federal rules require that all construction sites greater than one disturbed acre be subject to plan review. Jurisdictions may, at their discretion, require plan review for smaller sites based on local conditions and needs.

Description: To ensure that construction sites include the required stormwater controls, review pre-construction site plans to ensure that they include appropriate erosion and sediment controls and post-construction controls in compliance with the local ordinance and the adopted stormwater management *Manual*. Combine this pre-construction review of E&S controls with the review of post-construction controls to streamline the review time and conserve resources. EPA recommends that procedures for site plan review include the review of individual pre-construction site plans to ensure consistency with local sedimentation and erosion control requirements. At a minimum, include review of all plans for construction sites disturbing at least one acre in the site plan review process.

Potential Action Plan and Schedule: Once a stormwater ordinance is updated/adopted for Stayton, construction site plans will be reviewed to ensure they are in compliance with local ordinances and stormwater management manuals. Plans will also be reviewed for appropriate use of erosion and sediment BMPs as well as post-construction controls.

Start reviewing site plans for erosion control beginning in year 2. This will allow development of the stormwater ordinance and training of staff. Until that time the 1200-C permit process administered by DEQ will be used to review and control construction runoff in Stayton.

Measurable Goal: Once this effort has started, City staff will monitor the number of permit reviews, the number of on-site inspections, and the number of on-site revisions required. If enforcement is required this will also be recorded. All records will be reported annually.

5.4 Receive Information from Public

Publish a phone number, or equivalent system, to receive information from the public on construction site runoff issues. Set up a process to pass this information off to field inspectors.

Description: To meet this requirement, list a phone number for "construction-related complaints" in the local government pages, published in brochures and listed on the jurisdictions web site, if available. Direct this phone number to the appropriate staff person, such as an administrative assistant or a construction inspector.

Keep written logs of all complaints that include the date and time of the call, location of the construction site, and the nature of the complaint. Provide information on these complaints to the local construction inspectors by the end of the day; the goal is to have inspectors follow-up on each complaint within three days.

Potential Action Plan and Schedule: On brochures, permit applications, and other publications, the phone number of the City's Stormwater Department will be given to allow the public to report complaints and/or comments from the general public regarding construction site runoff. These comments and follow-up activities will be monitored internally by City Staff. The City's construction inspector will receive information on the complaint by the end of the day and will be responsible for following up on each complaint within 2 days.

Measurable Goal: Record the number of complaints received and handled, and submit with the annual report.

5.5 Inspect Construction Sites

Inspect all construction sites during the construction period that are regulated by the ordinance adopted in Section 5.1.

Description: Once site plans receive approval for E&S controls, it is extremely important to ensure that E&S controls are properly installed and maintained, and that the site plan reflects changes made on-site (e.g., different types of controls used and changed location of controls). Frequent and consistent inspections are the key to ensuring proper installation and maintenance of E&S controls. At a minimum, inspect all construction sites at least once during the project period.

Set inspection priorities based upon local goals, resources, and known problem areas. These priority sites can be based on particular areas or the priority sites can be based on specific operators with past problems or larger construction sites.

Potential Action Plan and Schedule: All construction sites which are required to submit site plans for erosion and sediment control will be inspected to ensure that the selected BMPs are installed and maintained correctly. Site plans must also reflect changes made on-site after the plans were reviewed. The frequency of inspection will be determined based on the complexity of the project. Each construction site shall be inspected at least once.

Inspection will start in year 3 of the program.

Measurable Goal: Records of the inspections and any follow-up work will be kept and submitted annually.

5.6 Provide Information on Training for Construction Operators

Provide information on local training available to construction operators on how to install and maintain effective erosion and sediment control and how to comply with the requirements in the adopted stormwater management *Manual*.

Description: Local jurisdictions do not need to conduct this training for local construction operators, but should direct construction operators to available training resources if requested. This could be provided as a single page handout during the pre-construction meeting or as requested.

The training described in Section 5.2 also applies to local construction operators. In fact, many classes will include a mix of both municipal construction plan reviewers and inspectors, along with local construction operators.

Potential Action Plan and Schedule: A brochure on construction site erosion control and post construction controls will be prepared and distributed (see Section 2.3). This will include brief descriptions of methods, sources of information for erosion control methods, including DEQ's manual and web sites. The brochure will also include information on training available for local construction operators. If contractors require further training following the classes provided by DEQ.

Develop Erosion Control brochure by year 2.

Measurable Goal: Document the distribution of the erosion control brochure and the scheduled classes along with attendance, and submit with the annual report.

6.0 POST-CONSTRUCTION STORMWATER MANAGEMENT PROGRAM

In order to meet regulations under 40 CFR 122.34(b)(5), the City of Stayton will develop a program for post construction stormwater management. The following table describes efforts that could be undertaken and planned for the 5-year program.

TABLE 6-1
POST-CONSTRUCTION STORMWATER MANAGEMENT PROGRAM

BMP Activity / Description	Permit Year 1	2	3	4	5
Ordinance Requiring Post-Construction Controls	√	√	–	–	–
Develop a Plan to Address Post-Construction Run-off	√	–	–	–	–
Training for Plan Reviewers and Field Inspectors	√	–	–	–	–
Training for Local Engineers and Developers	√	–	–	–	–
Site Plan Review for Post-Construction BMPs	√	√	√	√	√
Inspections of Structural Post-Construction BMPs	√	√	√	√	√

√	Activity scheduled for year	–	No activity scheduled for year

6.1 Ordinance Requiring Post-Construction Control

For permits or authorizations issued by the jurisdiction for construction of private developments, require through an ordinance, the installation and proper maintenance of post-construction runoff controls in compliance with an adopted stormwater management *Manual/Standards* or other guidance document. The size of the development requiring post development stormwater controls will be laid out the management manual and is at the discretion of the City.

This ordinance might already be in place but should be reviewed. The ordinance will not contain the detailed design requirements but will only reference the Stormwater Manual/ Design Standards being developed as part of the master plan effort and discussed below in Section 6.2.

Description: Combine the post-construction ordinance with the illicit discharge and construction ordinance, described in Sections 4 and 5 respectively, into a single stormwater ordinance. This ordinance largely requires local construction sites to comply with a local stormwater manual. After the ordinance is adopted, plan on evaluating the effectiveness of this ordinance during subsequent years of the permit.

EPA only requires the ordinance to "address post-construction runoff from new development and redevelopment projects" but does not say specifically what the ordinance must include. The ordinance could be as simple as requiring post-construction runoff to be no greater than pre-construction runoff.

Ensure that the ordinance addresses post-construction runoff from new developments and redevelopment projects that disturb more than one acre. The term "redevelopment" should refer to alterations of a

property that change the "footprint" of a site or building and is not intended to include such activities as exterior remodeling, which would not be expected to cause adverse stormwater quality impacts and offer no new opportunity for stormwater controls.

Potential Action Plan and Schedule: Stayton will adopt a new stormwater ordinance that will include illicit discharges, construction site runoff, and post construction runoff. The stormwater ordinance is scheduled to be prepared and adopted in the first year of the 5-year program.

Measurable Goal: Adopt ordinance by the end of the first year of the program.

6.2 Develop a Plan to Address Post-Construction Runoff

Develop a plan to address post-construction stormwater runoff during the plan review, construction inspection, and post-construction maintenance inspection process.

Description: To develop a plan to address post-construction stormwater runoff, consider the key water quality and water quantity issues in the City and surrounding area. Incorporate findings from the stormwater master plan and existing flood management and stormwater planning strategies into the post-construction plan. Also, evaluate the existing plan review process to identify opportunities to integrate post-construction controls. For example, new developments under plan review provide an opportunity to reduce impervious surfaces or incorporate traditional or other BMPs.

Where water quality impairments have been identified by DEQ within the jurisdiction, include strategies or BMPs in the post-construction plan targeted to reducing those pollutants.

Potential Action Plan and Schedule: Stayton currently has stormwater design standards which predominantly specify the "nuts and bolts" of planning, designing, and constructing the physical drainage system and its components. As part of the master plan process the design requirements for stormwater detention facilities and water quality treatment facilities will be developed and incorporated into the new stormwater design standards. A formal post-construction runoff program designed to meet NPDES requirements would involve the development of much more detailed specifications for such treatment facilities (often referred to as Best Management Practices, or BMPs).

The Stormwater Design Manual/Standards should be developed in the first year of the program.

6.3 Training for Plan Reviewers and Field Inspectors

Provide training or coordinate with existing training efforts to educate construction plan reviewers and field inspectors on post-construction design standards, runoff control BMPs and maintenance standards.

Description: Coordinate post-construction training for plan reviewers and field inspectors with training identified in section 5.2, training for erosion and sediment control.

Potential Action Plan and Schedule: Once an ordinance is in place, Stayton will train City staff responsible for reviewing plans and inspecting construction sites to ensure that appropriate post-construction stormwater management is employed. If possible, training will be coordinated with training on erosion and sediment control BMPs. "Refresher" training will update staff on changes to the procedures as needed.

The training of staff will begin in the first year of the program.

Measurable Goal: The number of hours spent in training along with subjects will be documented and reported annually.

6.4 Site Plan Review for Post-Construction BMPs

In accordance with the plan developed in Section 6.2, review stormwater site plans prior to construction to ensure that they include post-construction controls in compliance with local ordinances and the adopted stormwater management *Manual*. Require submittal of information pertaining to the proper operation and maintenance of storm drain components and BMPs. This work should be coordinated with the review in Section 5.3.

Description: The site plan review process, for both erosion and sediment control practices and post-construction control practices, is described in Section 5.3. Conduct both of these reviews at the same time to ensure that plans include all the practices necessary to meet the requirements of the adopted stormwater management *Manual*.

Potential Action Plan and Schedule: Once the stormwater ordinance is adopted and design criteria or a design manual is developed, the City staff will start reviewing permit drawings for compliance with local ordinances and stormwater management manuals. Plans will also be reviewed for appropriate post-construction controls as well as erosion and sediment BMPs.

Reviewing site plans for post construction BMPs should start as soon as the ordinance is in place in the first year of the program.

Measurable Goal: Once this effort has started City staff will monitor the number of plan reviews, the number of on-site inspections, and the number of on-site revisions required. If enforcement is required this will also be recorded. All records will be reported annually.

6.5 Inspections of Structural Post-Construction BMPs

In accordance with the plan developed in Section 6.2, inspect priority structural post-construction BMPs for compliance with operation and maintenance (O&M) standards.

Description: Develop a program to ensure the long-term O&M of structural stormwater BMPs. This requirement only applies to new BMPs installed as part of new construction; existing BMPs installed prior to the effective date of the Phase II permit are not specifically addressed.

The post-construction O&M program includes the following components:

- Requirements for private property owners to maintain facilities
- Database of structural BMPs
- Inspection procedures, including a schedule for conducting inspections, and
- Inspection form

Potential Action Plan and Schedule: Stayton will develop an operations and maintenance program for public and private post-construction stormwater controls. The program will include requirements for private property owners to maintain facilities, a database of structural BMPs, inspection schedules and procedures, and an inspection form. This activity should start when the post-development BMP's are required.

Measurable Goal: Once this effort has started, City staff will keep records of the number of BMPs installed, inspection schedules, and procedures. The City will also maintain copies of the inspection reports for each facility. If enforcement is required, this will also be recorded.

7.0 POLLUTION PREVENTION IN MUNICIPAL OPERATIONS PROGRAM

In order to meet regulations under 40 CFR 122.34(b)(6), the City of Stayton will develop a formal operations and maintenance plan. The following presents the requirements for the plan, how they are being achieved and the implementation schedule.

Basically most City operations already meet the requirements for NPDES Phase II. These requirements are generally "good housekeeping" measures when servicing vehicles and maintaining City facilities. The Operation and Maintenance (O&M) Plan will be a documentation of existing activities together with suggested modifications to reduce pollutants. The following table describes efforts that could be undertaken and planned for the 5-year program.

TABLE 7-1
POLLUTION PREVENTION IN MUNICIPAL OPERATIONS PROGRAM

BMP Activity / Description	Permit Year				
	1	2	3	4	5
Operations and Maintenance (O&M) Plan	√	–	–	–	–
Park and Open Space Maintenance	√	–	–	–	–
Vehicle & Equipment Maintenance & Washing	–	–	√	–	–
New Construction and Land Disturbance	–	√	√	√	√
Dust Control Practices	–	√	√	√	√
Stormwater System Maintenance	–	√	–	√	–
Open Channels and Structural Stormwater Controls	–	√	–	√	–
Roads, Highways, and Parking Lot Maintenance	√	√	√	√	√
Flood Management Project Evaluations	√	–	–	–	–
Employee Training on O&M Plan Implementation	√	–	–	–	–
Stormwater Plans for Municipal Facilities	√	–	–	–	–

√	Activity scheduled for year	–	No activity scheduled for year

7.1 Operation and Maintenance (O&M) Plan

Develop and implement a municipal O&M Plan that considers, where appropriate all the BMPs within Section 7 of this documents.

Description: An O&M plan is essential to ensure that all municipal activities and programs impacting stormwater are implemented efficiently and effectively. The O&M plan is intended to reduce the amount of pollutants carried by stormwater runoff into the storm drainage system. Comprised of a description of procedures and associated schedules, the O&M plan serves as a tool for all municipal employees that are directly involved in stormwater management or administer programs that impact stormwater. It also serves as the basis for the employee training program described in Section 7.10.

An O&M Plan contains the following information:

- Description of the required maintenance activities and procedures as it relates to existing municipal operations and programs
- List of responsible departments and personnel for each activity, and
- Schedule of activities, including maintenance, inspections and reporting

Potential Action Plan and Schedule: The City of Stayton will review existing municipal O&M activities and document the activities in an O&M Plan that will address municipal activities. The O&M Plan shall include the following:

- Descriptions of the required maintenance activities and procedures as it relates to existing municipal operations and programs
- A list of responsible department and personnel for each activity
- A schedule of activities, including maintenance, inspections & reports.
- Review the maintenance of Parks and open space.
- Review use of herbicides and pesticide and maintain records when applied.

The following sections discuss the particular maintenance activities to be addressed in further detail. The O&M Plan should be developed and implemented the first year of the program.

Measurable Goal: Plan preparation and records of all herbicide and pesticide use are the measurable goals for this activity.

7.2 Park and Open Space Maintenance

In accordance with the O&M plan developed, implement park and open space maintenance pollution prevention/good housekeeping practices.

Description: Municipal maintenance practices at parks and other open spaces (e.g., golf courses, picnic areas, recreational facilities, rights-of-way, landscaped areas in parking lots, plazas) can include fertilizer, herbicide, and pesticide application; vegetation maintenance and disposal; and trash management. To ensure these activities do not negatively impact stormwater runoff, incorporate these pollution prevention/good housekeeping procedures into existing municipal operations for maintaining parks and other open spaces.

Potential Action Plan and Schedule: Stayton will implement park and open space maintenance pollution prevention/good housekeeping practices as developed in the O&M Plan. These practices include fertilizer, herbicide and pesticide application; vegetation maintenance and disposal; and trash management. Currently, any herbicide or pesticide application is performed by a licensed applicator. Records of all herbicide and pesticide use are kept.

Measurable Goal: Same as Section 7.1 above.

7.3 Vehicle and Equipment Maintenance and Washing

In accordance with the O&M plan developed, implement publicly-owned vehicle and equipment washing pollution prevention/good housekeeping practices.

Description: Wash water from vehicle/equipment cleaning can contain oil and grease, suspended solids, heavy metals, organics, and other pollutants from detergents. Whenever possible, conduct vehicle/equipment cleaning in a self-contained, covered building. If the enclosed facilities are not available for vehicle/equipment cleaning, conduct this activity in a designated uncovered wash area that meets specific requirements.

Potential Action Plan and Schedule: If the City of Stayton already has a covered or self-contained location to wash and maintain vehicles the only action would be to require all vehicles to use the facility. If not the construction of such a facility is the action required. This involves a capital expenditure that should be work into the overall CIP program.

Measurable Goal: The measurable goals for this activity are the facility and the use of the facility.

7.4 New Construction and Land Disturbances

Description: This activity is simply requiring City construction projects following the same stormwater requirements as private developments.

Potential Action Plan and Schedule: Once new stormwater design standards for erosion control, post-development BMPs and other construction related activities have been established they will be incorporated into the City's CIP project. Public construction projects will be required to follow the same requirements and procedures as private development. Construction will be required to follow local ordinances, and design standards.

Measurable Goal: Records of the BMPs for public construction projects shall be kept; inspection reports and any follow-up work will be kept.

7.5 Dust Control Practices

In accordance with the O&M plan developed in Section 7.1, implement dust control practices where necessary on public projects.

Description: Follow appropriate BMPs to minimize and control dust from public construction projects. Dust control BMPs could be described in the adopted stormwater master plan, or other appropriate document.

Potential Action Plan and Schedule: Stayton will implement BMPs for dust control from public construction projects as developed in the O&M Plan. Public construction projects will be required to follow appropriate BMPs to minimize and control dust.

Measurable Goal: Implement dust control program upon completion of the O&M Plan.

7.6 Stormwater System Maintenance

In accordance with the O&M plan developed in Section 7.1, implement catch basin cleaning and stormwater system maintenance pollution prevention/good housekeeping practices.

Description: Several activities are suggested below; others can be added as needed.

- Catch Basin Inspections and Cleaning. Inspect catch basins and clean inlets at least once a year during the dry season. Based on inspection results, clean (i.e., remove debris from)

catch basins as required to prevent water quality impacts. During or before the wet season, perform inspection, clearing, and cleaning in areas that generate large quantities of waste and debris during rainstorms and snowmelt events. Using adaptive management, optimize maintenance activities and frequencies.

- Proper Waste Disposal. Dewater wastes collected during storm drain cleaning and maintenance, if necessary, into the municipal sanitary sewer. Do not dewater near a storm drain or stream. Store solid waste and debris in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain. Dispose of sediment waste appropriately, depending on the level of contaminants.
- Record keeping. Document the following information for inspections and cleaning of catch basins: 1) date, 2) location of catch basin, 3) activity performed (e.g., inspection or cleaning), and 4) description of condition or overall amount of material removed (estimated in either volume or dry weight).

Potential Action Plan and Schedule: Stayton will implement stormwater system maintenance as developed in the O&M Plan. Catch basins and other stormwater facilities will be inspected and maintained regularly. Waste from the stormwater facilities will be disposed of properly, and records of cleaning and maintenance will be kept. Street sweeping will be conducted at a frequency established under Section 7.1.

Measurable Goal: Keep records of storm drain system cleaning and maintenance activities and submit in annual report. Waste disposal operations will be included in the records.

7.7 Open Channels and Structural Stormwater Controls

In accordance with the O&M plan developed in Section 7.1, implement structural stormwater control pollution prevention/good housekeeping practices.

Description: Several activities are suggested below; others can be added as needed.

- Open Channel and Structural Controls Inspections and Cleaning. Inspect open channels and structural controls (e.g., detention ponds, commercial stormwater technologies) for trash and debris, and clean, if necessary, at least once a year during dry season. Inspect and clean open channels and structural stormwater controls in areas that generate significant waste and debris during rainy season.
- Proper Waste Disposal. Dewater wastes collected during storm drain cleaning and maintenance, if necessary, into the municipal sanitary sewer. Do not dewater near a storm drain or stream. Store solid waste and debris in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain. Sediment may contain elevated levels of lead, hydrocarbons, and oil and grease. If sediment contains elevated levels of these pollutants, dispose of as hazardous waste.
- Record keeping. Document the following information for inspections and cleaning of open channels and structural controls, including catch basins: 1) date, 2) location, 3) activity performed (e.g., inspection or cleaning), 4) description of condition or overall amount of material removed (estimated in either volume or dry weight).

Potential Action Plan and Schedule: Stayton will implement open channel and structural stormwater control maintenance as developed in the O&M Plan. Open channel and structural stormwater controls will

be inspected and maintained regularly. Waste from the stormwater controls will be disposed of properly, and records of cleaning and maintenance will be kept.

Measurable Goal: Maintain records of maintenance activities and submit in annual report.

7.8 Road, Highway, and Parking Lot Maintenance

In accordance with the O&M plan developed in Section 7.1, implement deicing and snow removal pollution prevention/good housekeeping practices for roads, highways, and parking lots.

Description: Maintaining roads, highways, and parking lots for public safety purposes can generate pollutants that will enter the storm drainage system. Include in the O&M plan pollution prevention procedures related to these maintenance activities. This could be adopting and following the ODOT "Routine Road Maintenance – Water Quality and Habitat Guide Best Management Practices" (ODOT, July 1999).

Potential Action Plan and Schedule: The City of Stayton should adopt existing guideline or develop a set of guidelines for maintenance of roads as part of the O&M Plan developed in Section 7.1.

Measurable Goal: Maintain records of maintenance activities.

7.9 Flood Management Project Evaluations

In accordance with the O&M plan developed in Section 7.1, implement flood management project evaluation and review procedures.

Description: Flood control has been the traditional focus of stormwater management in many communities. Traditional approaches to flood management often include projects such as widening channels, dredging riverbeds, or creating dikes, levees or embankments. By incorporating water quality considerations into project review criteria, negative impacts to water quality from new flood management projects can be decreased. In designing and/or evaluating flood management projects, attempt to employ more natural solutions and use controls that preserve the hydrology of a site (e.g., swales and natural channels, riparian buffers) as a first-line of flood control. Evaluate existing flood management projects to determine whether or not additional water quality protection devices should be added.

Potential Action Plan and Schedule: Stayton is in the process of developing and implementing a Stormwater Master Plan. This process will address increased runoff and flows, water quality and capital projects. All new flood management projects will include water quality considerations. Priority existing flood management projects will be identified and re-evaluated with water quality considerations.

This program will be developed in the first year of the program. Implementation will be scheduled based on priorities, funding and identifying opportunities to associate projects with other scheduled projects.

Measurable Goal: Track annual capital expenditures for stormwater improvements.

7.10 Employee Training on O&M Plan Implementation

Develop materials and conduct employee training on the procedures contained in the O&M plan developed in Section 7.1.

Description: At a minimum, employees in targeted positions (generally employees involved in stormwater management or municipal maintenance) should be trained on the requirements in the stormwater program by the end of permit term. Consider providing brief (1 hour) training to all municipal employees. More specific, specialized training can be developed for specific program areas. In addition to more intensive training, ensure that municipal employees have access to the public education materials produced under the public education minimum measure (Section 2).

Potential Action Plan and Schedule: Once the above items are completed, Stayton will train municipal city staff on operation and maintenance procedures as described in the O&M Manual. The staff training will occur in combination with training for Illicit Discharge and spill plan. Training will be general for all municipal employees and more specific training will be included for specific program areas. "Refresher" training will update staff on changes to the procedures as needed.

The training of staff will begin in year 2 of the program with refresher courses and courses for new staff conducted as the need requires.

Measurable Goal: The number of hours spent in training, along with subjects, will be documented.

7.11 Stormwater Plans for Municipal Facilities

Develop plans for all municipal facilities that would reasonably be expected to discharge contaminated runoff and are not covered under the NPDES Industrial Stormwater General Permit (1200-Z). Submit a permit application for all municipal facilities that are required to be covered under the 1200-Z General Permit.

Description: Some municipally owned or operated industrial facilities that discharge stormwater runoff to surface waters and/or storm drains are required to apply for coverage under DEQ's Industrial Stormwater General Permit.

Municipal facilities that would reasonably be expected to discharge contaminated runoff and are not covered by the Industrial Stormwater General Permit should also have a stormwater plan developed. These facilities could include parking lots, fair grounds, storage facilities, maintenance facilities, airports, parks/sports fields, municipal buildings and any other municipally owned facilities.

Potential Action Plan and Schedule:

Industrial Stormwater General Permit (1200-Z)

Municipal facilities subject to this permit typically include:

- Landfills that receive or have received any industrial wastes (even closed landfills).
- Vehicle maintenance shops for local public transportation.
- Wastewater treatment plants with a design flow of 1.0 million gallons per day.
- Other municipal facilities could be required to apply for this permit. For more information and a full list of the types of facilities required to apply, see: http://www.deq.state.or.us/wq/wqpermit/StormWaterHome.htm.

Stormwater Plans

To implement this BMP, follow these steps:

1. Assess and Screen Municipal Facilities

Collect information on each municipally-owned or operated facility within your jurisdiction to assess the potential stormwater impact. If necessary, conduct site visits. Assess each facility to determine which of the following categories it falls into:

- Needs an Industrial Stormwater Permit. This facility falls within one of the SIC codes regulated by the permit and discharges to surface waters. Submit an industrial stormwater permit application.
- Some surface water pollution potential. Facilities that are not covered by the Industrial Stormwater Permit may still have the potential to impact surface waters. For facilities that have a potential to discharge contaminated runoff, a stormwater plan should be developed.
- Little/no surface water pollution potential. This facility either doesn't discharge to surface waters or has little or no potential to impact stormwater quality. No stormwater plan is required.

As you assess municipal facilities, consider factors such as distance to storm drains and surface waters, site activities, traffic flow, exposure to potential stormwater contaminants, facility size, existing stormwater BMPs already in place, and other relevant factors.

2. Prepare site-specific stormwater plans

The development of facility-specific pollution prevention plans should be based on guidance in the adopted stormwater management *Manual*. Consider including the following information in each stormwater plan:

- Description of storm drain system
- Materials storage, including exposure of potential pollutants
- Current O&M of storm drain system and structural BMPs
- Education/Training activities on stormwater
- Source Control activities
- New stormwater BMPs and pollutant control strategy
- Roles/responsibilities for stormwater
- Cost estimates

3. Prepare training materials and conduct training

Prepare training materials and conduct training at each facility on the practices described in the stormwater plan. This training should be coordinated with the general employee training as described in section 7.10.

4. Implement stormwater plans

Carry out implementation of the stormwater plan at each facility.

Measurable Goal: Submit permit application for municipal facilities that are required to be covered under the NPDES Industrial Stormwater General Permit (1200-Z). Identify municipal facilities that would

reasonably be expected to discharge contaminated runoff and not covered under the 1200-Z General Permit, and develop pollution prevention plans for these facilities.

8.0 EVALUATION AND ASSESSMENT

Once again the City of Stayton is not required to obtain a NPDES Stormwater Permit and therefore nothing above is required under the NPDES stormwater program. Under the Willamette TMDL program it is expected that DMAs under 10,000 give consideration to the six minimum control measures identified in the NPDES Phase II program. Therefore the reporting of these activities to DEQ is unclear, however if the City's record keeping procedures on these activities are in place this will cover the City under stormwater quality requirements by DEQ, EPA and water quality surrounding ESA (Endangered Species Act). This will not cover the City under fish passage requirements.

If under an NPDES permit, and in preparation for the annual reporting requirements, the City of Stayton will document program implementation and progress. The Measurable Goals listed in this Program are initial goals. The City will work towards meeting those requirements for the Phase II permit that are not currently being implemented. The Measurable Goals in this Program reflect the implementation schedule of each of the BMPs. Once the BMP has been implemented, the City will revise the Measurable Goal for that requirement to track the progress of implementation, effectiveness, or environmental improvement as appropriate.

Appendix D.4

TMDL

TETRA TECH/KCM
7080 SW Fir Loop
Portland, Oregon 97223-8022

Technical Memorandum

City of Stayton
STRATEGIES FOR REDUCING POLLUTANTS IN SURFACE WATERS

January 5, 2007

The City of Stayton has been identified as a Designated Management Agency (DMA) in the Willamette River Total Maximum Daily Load (TMDL) program. Stayton is within two drainage basins—Mill Creek and North Santiam—both of which are in the Willamette River Basin. The Oregon Department of Environmental Quality (DEQ) adopted TMDL limits for the Willamette River Basin in September 2006.

This memorandum describes the pollutants of concern under the Willamette Basin TMDL program and presents the best management practices (BMPs) that are appropriate for reducing each of them.

POLLUTANTS OF CONCERN

The Willamette Basin TMDL set limits on bacteria, temperature and mercury for surface waters within the basin. Table 1 summarizes these water quality problems, their sources, and methods for addressing them.

STORMWATER BEST MANAGEMENT PRACTICES

Stormwater pollutant removal can be addressed with both nonstructural and structural BMPs. Nonstructural BMPs typically focus on pollution prevention; structural BMPs typically remove pollutants from stormwater before discharging into the receiving stream or stormwater system.

Nonstructural BMPs

Table 2 summarizes the benefits of nonstructural BMPs that are now or could easily be put in place to address potential causes of water quality problems. It also identifies minimum control requirements under Phase II of the National Pollutant Discharge Elimination System (NPDES) that each BMP helps satisfy. Table 3 translates the benefits of the nonstructural BMPs to the priority pollutants for the Willamette Basin. Pollution reduction as a result of these programs is not easily quantified but tends to occur gradually or incrementally. The nonstructural BMPs with the most easily quantifiable results relate to maintenance activities. Options for improved maintenance activities are described below, followed by descriptions of more general, long-term BMPs.

Storm Drain Maintenance

Improving storm drain maintenance provides immediately quantifiable results in improving stormwater quality. A well-defined stormwater maintenance program is a working tool for the benefit of City maintenance personnel. Such a program provides a general guide to help ensure that the work required to keep the stormwater system functioning properly is performed efficiently and in a timely way.

TABLE 1.
TMDL POLLUTANT SUMMARY

Typical Sources	Potential Solutions
Bacteria—*Bacteria in rivers and streams can pose a health risk.*	
Illicit Discharges	Adopt an illicit discharge program
Leaking Pipes	
Failing Septic Systems	Extend sewer lines and treatment for area-wide failing onsite septic systems
Pet Wastes	Educate public regarding pet waste pick up
	Provide pet waste pick up stations in parks
Agriculture Livestock	Ensure proper management of agriculture lands
Wildlife	Provide vegetated stream buffers
Temperature—*During the summer and early fall, water temperatures in the Willamette River and its tributaries are elevated to levels that are harmful to salmonids.*	
Lack of Shading	Restore riparian areas
Low Stream Flows	Consider temperature impacts when designing stormwater BMPs
Stormwater Runoff	
Mercury—*Mercury is a neurotoxin that can cause damage to the brain and nervous system. Consumption of fish or seafood containing elevated levels of mercury is the primary method of exposure for humans.*	
Soil Erosion	Erosion and sediment control for construction sites
	Stormwater maintenance
Dental Practices	Dental amalgam BMP
Household Products	Community collection events
Atmospheric Mercury Deposits	

The following elements can be included in a stormwater maintenance program:

- **Core maintenance activities**—The essential tasks to be performed to maintain the City's stormwater system such as street sweeping and catch basin cleaning.

  Street sweeping and catch basin cleaning have the benefit of flexibility, in that the equipment can be deployed at times and places as needed. Studies have shown significant improvement in the amount of solids removed from streets, and hence prevented from entering the storm drain system, with increased use of street sweeping and catch basin cleaning. A 1999 Port of Seattle study found that frequent street and catch basin cleaning can offer water quality benefits comparable to the use of a wet vault for stormwater treatment.

- **Guidelines for work in environmentally sensitive areas**—Provide guidelines for maintenance staff to address the specific considerations that must be taken into account when maintenance activities are performed in or near streams, wetlands and steep slopes.

- **Regulatory and permitting considerations**—Provide information to maintenance staff on regulations that may apply and permits that may be required when maintenance work is to be performed.

TABLE 2.
GENERAL BENEFITS OF NONSTRUCTURAL BMPS

	Benefit Area						
BMP	Lack of Cover	Low Flow	Erosion Dust	Waste	Stagnant Water	Illicit Discharge	NPDES[a]
Street Sweeping			◆				4, 5
Catch Basin Cleaning			◆	◆	◆	◆	4, 5
Development Standards	◆		◆	◆	◆	◆	5
Tree City Program	◆		◆				4
Pollution Prevention in City Operations				◆		◆	5
Pet Regulations				◆			5
Trash Container Protection, Separation				◆		◆	5
Illicit Discharge Inspection & Enforcement						◆	3, 5
System Mapping				◆	◆	◆	3, 5
Web Site	◆	◆	◆	◆	◆	◆	1
Bill Inserts	◆	◆	◆	◆	◆	◆	1
Talks, Articles	◆	◆	◆	◆	◆	◆	1
Public Reporting				◆		◆	2
Water Quality Monitoring	◆	◆	◆	◆	◆	◆	5
Farm Animal Management			◆	◆			5

a. Indicates the NPDES minimum control requirements that the BMP helps to satisfy: 1 = Public education; 2 = Public involvement/participation; 3 = Illicit discharge detection & elimination; 4 = Post-construction controls; 5 = Pollution prevention/good housekeeping.

- **Sediment and debris management**—Handling and disposing of the solids, organic debris, and trash that accumulate in facilities such as catch basins, vaults, and swales and should be disposed of appropriately.

Organic debris such as leaves should be composted. Tree limbs should be chipped for mulch or composting. Organic material is considered a valuable resource by many people, and many landfills now provide a separate holding or composting area for these materials.

TABLE 3.
BENEFITS OF NONSTRUCTURAL BMPS FOR PRIORITY POLLUTANTS

	Pollutant Reduction		
BMP	Temperature	Mercury	Bacteria
Street Sweeping		◆	◆
Catch Basin Cleaning		◆	◆
Development Standards	◆	◆	◆
Tree City Program	◆		
Pollution Prevention in City Operations		◆	◆
Pet Regulations		◆	◆
Trash Container Protection, Separation		◆	◆
Illicit Discharge Inspection & Enforcement		◆	◆
System Mapping		◆	◆
Website	◆	◆	◆
Bill Inserts	◆	◆	◆
Talks, Articles	◆	◆	◆
Public Reporting	◆	◆	◆
Water Quality Monitoring	◆	◆	◆
Farm Animal Management			◆

Sediment removed from detention facilities, biofilters, open channels or culverts may be temporarily stockpiled as long as runoff is positively prevented and the pile is covered between November 1 and March 31. Generally, bottom sediments removed from these facilities are not classified as hazardous waste and have heavy metal concentrations less than those of typical wastewater sludge. These sediments can be disposed of by land application, or as required by the City Waste Management Division.

Pollutant-contaminated sediments, waste oil, and debris from oil/water separators must be disposed of in accordance with OAR 340-093 (Solid Waste: General Provisions), and where appropriate OAR 340-093-0170 (Cleanup Materials Contaminated with Hazardous Substances) and OAR 093-0190 (Waste Requiring Special Management).

Oil/water separator waste is often too “dirty” to be recyclable; however, several vendors handle waste oil hauling and disposal. Any standing water removed during maintenance operations should be disposed of in a sanitary sewer.

- **Illicit discharge detection program**—Detection and removal of illicit pollutant discharges to the stormwater system.
- **Safety and training**—Provide training for city maintenance staff on stormwater maintenance and safety.
- **Tracking and recordkeeping**—Efficient ongoing maintenance requires an organized system for recording and tracking maintenance needs and completed activities.

There are many documents to assist communities with developing an overall maintenance program to reduce pollutants and sediment in stormwater. A good document for citywide activities is *Oregon Municipal Stormwater Toolbox for Maintenance Practices* (Oregon Association of Clean Water Agencies, June 1998). The City's road maintenance department should adopt *Routine Road Maintenance; Water Quality and Habitat Guide Best Management Practices* (Oregon Department of Transportation, July 1999).

Vector Control

Vector control is a common concern in stormwater facilities. Regular maintenance is critical to the control of vectors in stormwater facilities. Mosquitoes are of particular concern. Mosquitoes breed in shallow areas of standing water. Regular maintenance to ensure proper function of stormwater facilities prevents clogging, removes overgrown vegetation, mends broken pipes and removes sediment that may block outlets.

Facilities should be designed to minimize mosquito habitat, particularly avoiding standing water for more than 72 hours. For facilities that are designed to hold standing water, regular monitoring is required for the presence of mosquitoes.

A vector control agency can assist in design requirements for reduction of habitat.

Reducing Impervious Surface

Impervious surface area is the single largest cause of the degradation of streams in urban areas. Degradation of streams begins with even small quantities of impervious surface (10-20 percent; Center for Watershed Protection, 1995). The correlation between impervious surface and the quantity of runoff has been a cornerstone of urban drainage studies. The effects of impervious surface on water quality is not as well understood, and the correlation is not as intuitively obvious. Studies have shown that reducing the amount of impervious surface by 20 percent can reduce total suspended solids by up to 90 percent. Runoff volumes can be reduced by 20 to 60 percent with a corresponding reduction in impervious area. A 20- to 40-percent reduction in impervious surface can reduce nitrogen by 40 to 70 percent and phosphorous by 40 to 80 percent (Land Conservation and Development and DEQ, 2000).

In areas with suitable soils, reducing impervious surface allows more infiltration. The increase in infiltration not only removes pollutants but also increases groundwater flow and therefore increases the base flow in streams. Increase base flow generally reduces water temperatures in streams. The following are BMPs that can help to reduce impervious surface area:

- Use of porous pavement for streets or parking areas with low traffic volume, such as fire lanes, parking area turnarounds or sidewalks
- Encouraging narrow roads in rural areas

- Constructing streets without curbs to allow drainage to run into vegetation
- Encouraging common parking areas for multiple businesses or residents
- Encouraging road patterns that minimize impervious surface
- Requiring BMPs, such as vegetated swales, to be installed in parking lots
- Separating sidewalks and housing from the street with a vegetation strip
- Reducing the number and size of cul-de-sacs
- Using smaller parking stalls
- Establishing a maximum number of parking spaces a developer is allowed to install (such as 10 percent over the relevant parking demand ratio)
- Establishing a differential between primary and spillover parking; allow spillover parking to use alternative paving surfaces such as grid pavers, porous pavement, gravel or mowed grass.

The City of Stayton could review its current street design ordinances to allow for and encourage reductions in impervious surfaces.

Sediment and Erosion Control

Erosion can be a large source of sediment loading in stormwater runoff or streams. Erosion comes from a variety of places, including construction sites, unstable slopes, and other surfaces with bare soil. BMPs to control sediment and erosion include encouraging the use and retention of native vegetation, restricting development in areas with steep slopes, and properly installing BMPs at construction sites.

Native vegetation has the additional benefit of reducing the use of water, pesticides and fertilizer. Properly selected native riparian vegetation can provide for shade along stream corridors, which reduces water temperatures.

Many construction BMPs are available, but they must be installed and used correctly to prevent sediment and other pollutants from leaving the site.

The City's 1994 *Storm Design Standards* has a section describing erosion control requirements; however, this section is limited to areas within the banks of a waterway. It is recommended that the standards be revised to require an erosion and sediment control permit and the use of BMPs for all construction projects and earth disturbance projects with ground disturbance greater than 1,000 square feet in area in any 12-month period.

Stream and Wetland Buffers

Stream and wetland buffers provide a natural boundary between development and a stream or wetland. Vegetated stream buffers maintain bank stability, reduce sediment and nutrient loads from overland flow runoff, and allow infiltration to occur. Vegetated buffers reduce pollutant loading when runoff crosses the buffer as sheet flow, not when pipes transport stormwater directly to the creek or when channels are formed and runoff bypasses the vegetation. When a buffer is vegetated and no pesticides or herbicides are applied, total suspended solids can be reduced by 40 to 80 percent. When lawns are not located within a stream buffer, nitrogen reductions of 25 to 65 percent and phosphorous reductions of 30 to

70 percent can be achieved. (Land Conservation and Development and DEQ, 2000). Buffers can be combined with other BMPs to ensure pollutant reduction.

To be effective, stream buffers must be managed and protected during construction and for the ongoing period after construction. Residents can be educated to prevent dumping, trails, tree removal, erosion and lawns encroaching into the buffer. Education can include pamphlets, boundary markers, buffer walks, regular homeowner association meetings and individual maintenance agreements. Residents can also be encouraged to participate in stewardship of buffers and streams. Allowable and unallowable activities in stream buffers should be clearly defined.

Shading

Riparian vegetation performs many beneficial functions for stream ecosystems. One of these is to regulate water temperature through direct shading. Factors that determine the amount of solar radiation that reaches a stream channel include the width of the channel, the type and density of riparian vegetation, the orientation (east-west vs. north-south) of the channel, and the angle of the sun.

Because the sun is usually positioned to the south in the Pacific Northwest, areas with southern exposure receive more direct sunlight than those with northern exposures, resulting in higher water temperatures. Riparian vegetation can provide shade from both sides of the stream, but shading from the southern direction provides the most thermal regulation. On north-south oriented streams, vegetation must grow on both sides to provide a shade canopy over the stream.

Enhancement Methods

Riparian vegetation enhancement can be facilitated in the following ways:

- **Capital improvement projects**—Capital improvement projects to enhance riparian area vegetation
- **Development requirements**—Requirements for improvement and/or protection of riparian vegetation and shading along a stream corridor for development close to stream channels
- **Public involvement/education:**
  - Encourage school and volunteer groups to take on stewardship of stream reaches, including planting and maintaining riparian vegetation
  - Encourage private landowners through education about the benefits of riparian vegetation.

The following could be implemented to maintain and improve shading as part of projects in Stayton that include stream work:

- Maintain trees and plant trees on the south side, to shade creeks.
- Use native, riparian vegetation for landscaping along creeks.

Stream Shade Monitoring

Photo documentation is an easy and cost-effective method for monitoring stream shade and canopy cover (*Stream Shade and Canopy Cover Addendum to the Water Quality Technical Guide Book,* Oregon Watershed Enhancement Boards, July 1999). Procedures for preparing a photo documentation

monitoring program, along with several other monitoring methods involving specific monitoring equipment, are described in the document. The addendum should be reviewed prior to development of a riparian shade monitoring program for the City of Stayton.

Farm Animal Management

Stayton is primarily an urban setting; however, there are some agricultural uses within the City. Farm animals contribute to erosion and increase nutrient loads in stormwater. Livestock should be kept out of riparian corridors and away from areas that drain directly to stormwater collection systems. Livestock BMPs include containment of contaminated runoff, proper storage of manure, installation of runoff treatment systems, reduction of livestock densities, and separation of livestock from sensitive water quality areas. The following are some guidelines for livestock from *Water Quality Model Code and Guidebook*:

- **Prohibited Areas**—Livestock shall not be kept within any of the following areas, as applicable, due to the higher intensity living environments of these areas or the potential impact on water quality:
  - Multi-family sub-district
  - Manufactured housing park sub-district
  - Neighborhood commercial sub-district
  - Within a riparian protection overlay.
- **Minimum Lot Size**—No livestock shall be kept on any lot less than 1 acre in area.
- **Density**—Limit the number of livestock over the age of 6 months that may be maintained per acre.
- **Farm Structures**—Establish a minimum distance from the property line for new barns, stables, and other buildings or structures used to house livestock.
- **Storage of fertilizer, pesticide herbicide, or animal waste**—Fertilizer, pesticides, herbicides and similar farm chemicals shall be covered and stored at an elevation 1 foot higher than the 100-year flood elevation. Animal waste that is collected shall also be stored at an elevation 1 foot higher than the 100-year flood elevation.

Structural BMPs

Numerous studies have been done on the effectiveness of structural BMPs. The pollution removal efficiency for structural BMPs vary based on the type of facility used, design, construction, and maintenance. Table 4 lists characteristics of various structural BMPs from *Stormwater Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring* (Federal Highway Administration, May 2000), the Oregon Department of Land Conservation and Development and Department of Environmental Quality *Water Quality Model Code and Guidebook* (October 2000), and the Center for Watershed Protection's *Site Planning for Urban Stream Protection* (December 1995). As summarized in the table, these sources indicate the effectiveness of BMPs in removing a wide range of pollutants. Temperature and bacteria are directly indicated in the table; mercury is included in the listings for total suspended solids (TSS). The table also indicates the BMPs' effectiveness in addressing pollutants of concern other than those included in the Willamette Basin TMDL: biochemical oxygen demand (BOD); oil and grease; total phosphorus (TP); total nitrogen (TN); and metals.

More detail is provided in such references as the City of Portland's *Stormwater Management Manual*, the King County (Washington) *Surface Water Design Manual*, and the Washington Department of Ecology's *Stormwater Management Manual for Western Washington*.

TABLE 4.
STRUCTURAL BMP SELECTION CHARACTERISTICS

BMP Types	Ultra-Urban	Area Served (acres)	BMP Area	Min. Head Req'd (feet)	Summer Temp Increase[a]	Contaminant Removal Percentage							Capital Costs	Maintenance	O&M Costs	Effective Life (years)
						TSS	Bacteria[c]	BOD	Oil & Grease	TP	TN	Metals				
Ext. Detention Wet Pond	no	2 (min)	10-20%	3-6	Yes	46-98	NA	25-45[d]	NA	20-94	28-50	24-89	Mod	Annual Inspection	Low	20-50
Underground Det. Tanks	yes	1-2	0.5-1%	5-8	No	NA	NA	10-20[d]	NA	NA	NA	NA	Mod to High	Frequent cleanout	High	50-100
Infiltration Trench	yes	2-4	2-4%	3-8	No	75-99	60-100	70-90	NA	50-75	45-70	75-99	Mod to High	Sediment and debris removal	Mod	10-15
Infiltration Basin	no	2-20	2-4%	3-4	No	75-99	60-100	70-90	NA	50-70	45-70	50-90	Mod	Mowing	Mod	5-10
Bioretention	yes	1-50	4-10%	2-3	No	75	NA		NA	50	50	75-80	Mod	Mowing / plant replacement	Low	5-20
Catch Basins and Inlets	yes	<1	none		No	20-40	NA	10-20[d]	NA	10-20[d]	10-20[d]	10-20[d]	Low	Frequent Cleanout	Low	?
Catch Basin Inserts	yes	<1	none	1-2	No	NA	NA		up to 90	NA	NA	NA	Low	Frequent Cleanout	Mod to High	10-20
Control Structures/Flow Restrictors	yes				No	20-40	NA	10-20[d]	NA	10-25[d]	10-20[d]	10-25[d]	Low	Frequent Cleanout	Low to Mod	
Manufactured Systems	yes	1-10	none	4	No	NA	NA		up to 96	NA	NA	NA	Mod	Periodic cleanout	Mod	50-100
Premanufactured Vaults[b]																
Storm Vault	yes	no limits	0.5-1%	low	No	86	NA		high	48	NA	36	Mod to High	Periodic cleanout and inspection	Mod	50-100
Vortech	yes		0.5-1%	low	No	80	NA		high	67	54	NA	Mod to High	Frequent cleanout	Mod	50-100
Multi-Chambered Treatment Train	yes	0.2-2.5	0.5-1.5%	4-6	No	83	NA		NA	NA	NA	95	High	Sand filter cleaning and replacement of oil absorbent material	High	5-20
Oil-Grit Separators (Coalescent Plate)	yes	1-2	<1%	3-6	No	20-40	NA	10-20[d]	50-80	<10	<10	<10	Mod	Frequent Cleanout	High	50-100
Ditches (with vegetation)	yes				Yes	0-50	NA	0-25[d]	0-25[d]	0-25[d]	0-25[d]	0-25[d]	Low	Frequent Cleanout	Low to Mod	
Vegetated Swales	yes	2-4	10-20%	2-6	Yes	30-90	NA	50-80	NA	20-85	0-50	0-90	Low to Mod	Mowing	Low	5-20
Vegetated Filter Strips	no	NA	25%	Neg	Yes	27-70	NA	50-80	NA	20-40	20-40	2-80	Low	Mowing	Low	20-50
Constructed Wetlands	no	1 (min)	10%	1-8	Yes	65	NA	40-80	NA	25	20	35-65	Mod to High	Annual Inspection / Plant replacement	Mod	20-50
Natural Streams/Wetlands	no				Yes	50-95	50-98	40-80	40-90	20-85	20-85	40-90	Low	Regular inspection / debris removal / erosion control	Low to Mod	
Vegetated Rock Filters	yes	2-5	3-5%	2-4	No	95	78		NA	82	75	21-80	High	Regular inspection and cleanout	High	5-20
Underground Sand Filters	yes	2-5	2-3%	1-8	No	70-90	NA		NA	43-70	30-50	22-91	High	Annual Media Removal	High	5-20
Surface Sand Filters	no	2-5	2-3%	5-8	No	75-92	NA		NA	27-80	27-71	33-91	Mod	Biannual media removal	Mod	5-20
Organic Media Filters	yes	2-5	2-3%	5-8	No	90-95	90		NA	49	55	48-90	High	Annual media removal	High	5-20
Porous Pavements	no	2-4	NA	NA	No	82-95	NA		NA	60-71	80-85	33-99	Low	Semi annual vacuum cleaning	Mod	15-20

General Source: *FHWA-EP-00-002 Stormwater Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring*, February 2000.

NA means Not Applicable or Not Available

a. Open systems exposed to solar radiation that do not infiltrate assumed to increase water temperature in summer.
b. Per manufacturer's monitoring reports.
c. *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs* (Thomas R. Schueler, July 1987), bacteria removal data for infiltration noted bacteria as fecal coliform, pp. 1-6, 2-13. Data for other BMPs is from FHWA; data falls within the 60%-100% removal range, and is presumed to apply to fecal coliform bacteria.
d. Estimated based on 50% particulate fraction

Appendix D.5

UIC

Oregon DEQ UIC Program Information

Web Address: http://www.deq.state.or.us/wq/uic/uic.htm
Phone: (503) 229-5945

There is no grandfather clause for existing UIC systems. All systems must go through the registration process and either be permitted or rule authorized. Each UIC is evaluated on a case by case basis, and registration through the DEQ can take up 90 days.

Existing unregistered UICs that are to be decommissioned must be brought to the attention of the DEQ and follow DEQ's decommissioning process.

Subsurface infiltration systems, such as drywells, are classified as Class V injection wells in the EPA's federal UIC program. The two requirements of the UIC program are as follows:

- A non-endangerment performance standard must be met, prohibiting discharges that allow movement of fluids containing contaminants into potential underground sources of drinking water.
- All UIC facility owners/operators must provide inventory information by registering the facilities.

Under the federal UIC regulations, the definition of an underground injection well is a bored, drilled, or driven shaft whose depth is greater than the largest surface dimension; a dug hole whose depth is greater than the largest surface dimension; an improved sinkhole; or a subsurface fluid distribution system that includes an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground.

Examples of a UIC well or a subsurface infiltration system are drywells, drain fields, pipe or French drains, and other similar devices that discharge to ground. In addition to the non-endangerment standard, storm water injection systems will qualify as "rule authorized" only if no other disposal option is appropriate. Oregon Administrative Rules (OAR) 340-044-0030 specifically prohibits injection wells with depths greater than their largest surface dimension, if any other treatment or disposal method which "affords better protection of public health or water resources is reasonably available or possible."

All "rule authorized" systems must meet the *General Requirements* in RA 1101. Further provisions in *Basic Requirements* must be met by all injection systems except roof drains. Additional specific *Category Requirements* (per RA 1101) apply to the following categories:

- Municipal systems with 50 or more injection wells

- Municipal systems with less than 50 injection wells
- Industrial/commercial facilities with hazardous substances
- Industrial/commercial facilities without hazardous substances
- Large parking lots
- Small parking lots
- Residential systems included in the UIC Program (e.g. garage floor and driveway drains)

Owners of any category of "rule authorized" storm water injection systems (except residential) must prepare and implement a storm water management plan. The required elements of the plan vary depending on the size of the system. Certain elements – system assessment; Best Management Practices (BMPs) for source control and treatment; spill prevention and response; maintenance plan; employee and public education; and evaluation of plan effectiveness – are required for any size system. For municipal systems with 50 or more injection systems, storm water management plans must also have monitoring and record-keeping plans.

Department of Environmental Quality (DEQ) has developed recommendations for source control measures, spill response, storm water maintenance standards, education outreach, and monitoring. These are documented in "DEQ Underground Injection Control (UIC) Class V BMPs for Groundwater."

If an injection system does not qualify as "rule authorized", the Owner may be required to either: 1) modify the system so it meets the criteria for rule authorized; 2) close the injection system; 3) discharge to a municipal storm sewer, if available; or 4) apply for a Water Pollution Control Facility (WPCF) Permit. DEQ will be developing a general WPCF storm water permit for Class V systems which fail to meet Rule Authorization requirements.

Municipalities with over 50 injection systems need to develop a Decommissioning Plan for injection systems that do not meet the *Basic Requirements* (Oregon Administrative Rules (OAR) 340-044-0018). DEQ documents (Ref. 5 and 6) outline evaluation steps needed, and suggest closure standards for storm water injection systems. DEQ Storm water Management Guidelines outline different methods to remove pollutants from storm water prior to groundwater discharge, including alternatives to injection wells.

Municipalities also have the option to negotiate an area-wide permit or memorandum of agreement with DEQ for systems that fail to meet Rule Authorization requirements. (As of March 2002, no area-wide UIC Class V agreements had yet been negotiated.) An area-wide permit would need to include the following elements:

- Quarterly inventory reporting of new injection systems
- Use of DEQ database spread sheet

- GPS location data
- Monitoring and maintenance plans
- Maintenance schedule
- Storm water management
- Screening for hazardous areas
- Spill plans
- Closure and remediation requirements
- Inspection and enforcement options
- Information on existing land uses and any available data on unsuitable areas (soils)

In summary, any owner or operator of a Class V storm water system is required to:

- Register system prior to use, and provide inventory data to Department of Environmental Quality (DEQ).

- Meet “non-endangerment” performance standard to prevent contamination of groundwater by storm water.

- Submit a closure plan to DEQ, and then properly decommission a banned system or any system when it is no longer in use.

- Comply with other local, state and federal regulations (including requirements of the State Groundwater Act and the Safe Drinking Water Act Standards).