



Inland Empire
UTILITIES AGENCY*
*A Municipal Water District



Clean, inexpensive, plentiful water

Analyzing CECs

FOR THE
CHINO BASIN RECYCLED WATER
GROUNDWATER RECHARGE PROGRAM

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SAWPA Emerging Constituents Workgroup



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Initial Efforts

- April 2005 GWR permit required monitoring “Endnote 5” compounds annually.
 - Chemicals with State Notification Levels & Nitrosamines
 - Hormones & Pharmaceuticals methodology still in development stages, primarily at research facilities.



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- Send Endnote 5 to many local Southern California Labs
 - None could perform complete list
- IEUA went through bid process to find a lab able to perform or were willing to develop methods.
 - 2 responses
 - 1 east coast Lab, >\$100,000 to develop methods.
 - 1 in Washington state \$12,000 to develop and perform 1st set of samples.



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- Selected Columbia Analytical Services
 - Accredited Lab, California and other states
 - Used the isotope dilution technique
 - 1st samples were analyzed by the end of 2005 (only a partial list)
 - 4 sets have been analyzed to date
 - Not all compounds on Endnote 5 have been analyzed

Results - Endnote 5 Parameters

Recycled Water			
Chemical	Results	units	Method
Ethinyl estradiol	ND - 8.4	ppt	HPLC/MS-SEDC
17-b estradiol	ND - 10	ppt	"
Estrone	ND - 91	ppt	"
Bisphenol A	ND	ppt	"
Nonylphenol and nonylphenol polyethoxylate	ND - 810	ppt	"
Octylphenol and octylphenol polyethoxylate	ND - 150	ppt	"
Polybrominated diphenyl ethers (PBDE) 47	ND - 4	ppt	8270C SIM
PBDE 99	ND - 3	ppt	"
PBDEs 17, 28, 71, 66, 85, 100, 154, 153, 138, 128, 183, 190, 203, 206, 209	ND	ppt	"
Acetaminophen	ND - 1400	ppt	HPLC/MS-SEDC
Caffeine	ND - 67	ppt	"
Carbamazepine	ND - 480	ppt	"
Ethylenediamine tetra-acetic acid (EDTA)	ND	ppm	EPA 300.0MOD
Gemfibrozil	ND - 18	ppt	HPLC/MS-SEDC
Ibuprofen	ND - 170	ppt	"
Iodinated contrast media	1.2 - 460	ppt	"
Methadone	ND	ppt	"
Salicylic acid	ND - 35	ppt	"
Triclosan	5 - 54	ppt	"



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Endnote 5 split samples

	9/27/2007		2/5/2008			
	MWH	CAS	MWH	CAS	Units	Method
Hormones						
Ethinyl estradiol	8.4	<2	<1	<22	ppt	HPLC/MS-SEDC
17-B estradiol	<1	<2	<1	<22	ppt	HPLC/MS-SEDC
Estrone	91	<2	2.6	<11	ppt	HPLC/MS-SEDC
Pharmaceutical and Other Substances						
Acetaminophen	54	<10	<1	<110	ppt	HPLC/MS-SEDC
Caffeine	5.4	<5	3.2	<53	ppt	HPLC/MS-SEDC
Carbamazepine	14	45	125	130	ppt	HPLC/MS-SEDC
Gemfibrozil	<1	<1	3.1	<11	ppt	HPLC/MS-SEDC
Ibuprofen	<1	<10	<2.4	<110	ppt	HPLC/MS-SEDC
Triclosan	6.8	<10	18	<110	ppt	HPLC/MS-SEDC



Current Information

- Endnote 5 not intended to be “the List”
- More private labs available
- Research projects
- In December 2007 the EPA released 2 methods
 - EPA 1697 Pharmaceuticals and Personal Care Products
 - EPA 1698 Steroids and Hormones
 - both are available for general use but neither method has been incorporated in 40 CFR Part 136 as an approved method for use.