

TREATABILITY MANUAL

USER GUIDE/INDEX

OFFICE OF RESEARCH AND DEVELOPMENT
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PREFACE

In January, 1979, EPA's Office of Enforcement and Office of Water and Waste Management requested help from the Office of Research and Development in compiling wastewater treatment performance data into a "Treatability Manual."

A planning group was set up to manage this activity under the chairmanship of William Cawley, Deputy Director, Industrial Environmental Research Laboratory - Cincinnati. The group includes participants from: 1) the Industrial Environmental Research Laboratory - Cincinnati; 2) Effluent Guidelines Division; 3) Office of Water Enforcement and Permits; 4) Municipal Environmental Research Laboratory - Cincinnati; 5) R.S. Kerr, Environmental Research Laboratory - Ada; 6) Industrial Environmental Research Laboratory - Research Triangle Park; 7) WAPORA, Incorporated; and 8) MATHTECH, Incorporated.

The objectives of this program are:

- o to provide readily accessible data and information on treatability of industrial waste streams;
- o to provide a basis for research planning by identifying gaps in knowledge of the treatability of certain pollutants and waste streams.

The primary output from this program is a five volume Treatability Manual. This was first published in June 1980, with the March 1982 publication representing a major update of that previous work. The individual volumes are named as follows:

- Volume I - Treatability Data
- Volume II - Industrial Descriptions
- Volume III - Technologies
- Volume IV - Cost Estimating (In the process of revision for later publication)
- Volume V - Summary

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1. Pollutant Specific Data
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INTRODUCTION

This User Guide/Index is designed to present a direct guide to types of information in the Treatability Manual and the location of that information. The general content and organization of the Manual is as follows.

Volume I. Treatability Data. Descriptions of 200 toxic pollutants (including the USEPA designated priority pollutants), and summary information on their industrial origin and removability by wastewater control technologies. The format includes a standard six page description for each toxic (1,1.5 = pollutant properties; 2 = raw wastewater occurrence; 3 = treated wastewater occurrence; 4 = technology performance; 5 = water quality criteria).

Volume II. Industrial Descriptions. General descriptions of the "primary industries" named in the NRDC Consent Agreement and their major subcategories, including wastewater characteristics.

Volume III. Technologies for Control/Removal of Pollutants. Description of control unit operations/ processes, design variations, and operating experience for toxic pollutant removal. This is organized by technology, with a standard format to describe the technology, how and where it is applied, and considerations in its use. Technology Data Sheets and summary data are presented by technology for the toxic pollutants.

Volume IV. Cost Estimating. (This Volume is in preparation) Description of cost information for installed wastewater control equipment treatment processes, with both capital and operations/maintenance cost estimating data. These cost data are organized according to the technology descriptions in Volume III and also will include where available industry-specific cost data organized according to Volume II.

Volume V. Summary. References for all sources used in preparing the Treatability Manual, including a detailed description of the analytic protocols used to develop the data presented in Volumes I, II, and III. The protocol data are presented as Data Sets (i.e., a collection of data for a specific program using comparable methods), according to the industry organization of Volume II, and also the data in Volume III. Note that these Data Set descriptions in Volume V are referenced specifically on each data table in Volumes II and III.

This User Guide/Index is organized to present a specific location in the Treatability Manual for data on various topics (e.g., an industry, a pollutant, a technology, an SIC code). Note that the Treatability Manual number system identifies the pages for each Volume in an unambiguous manner:

Volume. Chapter. Section - Page.

The reference to the Treatability Manual in this guide is specified to the appropriate Section level.

The Manual is available through the Government Printing Office (GPO). The address is:

Superintendent of Documents
U.S. Government Printing Office
Department 50
Washington, D.C. 20420

Stock Number 055-000-00215-1
Cost: \$43.00 per set (four volumes)

1. POLLUTANT SPECIFIC DATA (VOLUME I)

This index shows the location of information in Volume I of the Treatability Manual pertaining to specific pollutants found in industrial wastewater. Volume I also contains as Section 1.17, a cross reference of pollutant names that may be helpful in locating a specific pollutant that is identified by an alternate name.

<u>Pollutant (cas #)</u>	<u>Treatability Manual Section</u>
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Mercury, Total (7439-97-6).	1.4.10
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2,3,7,8-Tetrachlorodibenzo-p- Dioxin (1764-01-6).	1.15.6
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Carbon tetrachloride (56-23-5).	1.12.4
Chlorobenzene (108-90-7).	1.9.2
Chlorodibromomethane (124-48-1)	1.12.19
Chloroethane (75-00-3).	1.12.5
2-Chloroethylvinyl ether (110-75-8).	1.5.4
Chloroform (67-66-3)	1.12.3
Dichlorobromomethane (75-27-4)	1.12.18
Dichlorodifluoromethane (75-71-8).	1.12.21
1,1-Dichloroethane (75-34-3)	1.12.6
1,2-Dichloroethane (107-06-2).	1.12.7
1,1-Dichloroethylene (75-35-4)	1.12.24
1,2-Dichloropropane (78-87-5).	1.12.13
1,3-Dichloropropylene (542-75-6)	1.12.14

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Methyl bromide (74-83-9)	1.12.17
Methyl chloride (74-87-3)	1.12.1
Methylene chloride (75-09-2)	1.12.2
1,1,2,2-Tetrachloroethane (79-34-5)	1.12.10
Tetrachloroethylene (127-18-4)	1.12.26
Toluene (108-88-3)	1.9.10
1,2-Trans dichloroethylene (156-60-5)	1.12.25
1,1,1-Trichloroethane (71-55-6)	1.12.8
1,1,2-Trichloroethane (79-00-5)	1.12.9
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2,4-Dichlorophenol (120-83-2)	1.8.3
2,4-Dimethylphenol (105-67-9)	1.8.10
4,6-Dinitro-o-cresol (534-52-1)	1.8.13
2,4-Dinitrophenol (51-28-5)	1.8.8
2-Nitrophenol (88-75-5)	1.8.6
4-Nitrophenol (100-02-7)	1.8.7
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Pentachlorophenol (87-86-5)	1.8.5
Phenol (108-95-2)	1.8.1
2,4,6-Trichlorophenol (88-06-2)	1.8.4

GC/MS Base/Neutral Compounds

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Benzo(a)anthracene (56-55-3)	1.10.2
Benzo(a)pyrene (50-32-8)	1.10.5
3,4-Benzofluoranthene (205-99-2)	1.10.3
Benzo(ghi)perylene (191-24-2)	1.10.8
Benzo(k)fluoranthene (207-08-9)	1.10.4
Bis(2-chloroethoxy)methane (111-91-1)	1.5.7
Bis(2-chloroethyl)ether (111-44-4)	1.5.2
Bis(2-chloroisopropyl)ether (36938-32-9)	1.5.3
Bis(2-ethylhexyl)phthalate (117-81-7)	1.6.5
4-Bromophenyl phenyl ether (101-55-3)	1.5.6
Butyl benzyl phthalate (85-68-7)	1.6.6
2-Chloronaphthalene (91-58-7)	1.10.1
4-Chlorophenyl phenyl ether (7005-72-3)	1.5.5
Chrysene (218-01-9)	1.10.12

GC/MS Base/Neutral Compounds (continued)

Dibenzo(a,h)anthracene (53-70-3)	1.10.7
1,2-Dichlorobenzene (95-50-1)	1.9.3
1,3-Dichlorobenzene (541-73-1)	1.9.4
1,4-Dichlorobenzene (106-46-7)	1.9.5
3,3'-Dichlorobenzidine (91-94-1)	1.7.5
Diethyl phthalate (84-66-2)	1.6.2
Dimethyl phthalate (131-11-3)	1.6.1
Di-n-butyl phthalate (84-74-2)	1.6.3
2,4-Dinitrotoluene (121-14-2)	1.9.11
2,6-Dinitrotoluene (606-20-2)	1.9.12
Di-n-octyl phthalate (117-84-0)	1.6.4
1,2-Diphenylhydrazine (122-66-7)	1.7.6
Fluoranthene (206-44-0)	1.10.13
Fluorene (86-73-7)	1.10.14
Hexachlorobenzene (118-71-1)	1.9.7
Hexachlorobutadiene (87-68-3)	1.12.15
Hexachlorocyclopentadiene (77-47-4)	1.12.16
Hexachloroethane (67-72-1)	1.12.11
Indeno(1,2,3-cd)pyrene (193-39-5)	1.10.6
Isophorone (78-59-1)	1.15.6
Naphthalene (91-20-3)	1.10.15
Nitrobenzene (98-95-3)	1.9.9
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N-nitrosodi-n-propylamine (621-64-7)	1.7.3
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Phenanthrene (85-01-8)	1.10.16
Pyrene (129-00-0)	1.10.17
1,2,4-Trichlorobenzene (120-82-1)	1.9.6

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Chlordane (57-74-9)	1.13.24
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4,4'-DDD (72-54-8)	1.13.12
Dieldrin (60-57-1)	1.13.9
alpha-Endosulfan (115-29-7)	1.13.1
beta-Endosulfan (115-29-7)	1.12.3
Endosulfan sulfate (1031-07-8)	1.13.2
Endrin (72-20-8)	1.13.13
Endrin aldehyde (7421-93-4)	1.13.19
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Heptachlor epoxide (1024-57-3)	1.13.21
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GC/MS Pesticides (continued)

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Toxaphene (8001-35-2)	1.13.25

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Acetic acid (64-19-7)	1.14.2
Allyl alcohol (107-18-6)	1.14.3
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Aniline (62-53-3)	1.9.13
Adipic acid (124-04-9)	1.14.14
Benzoic acid (65-85-0)	1.9.14
Benzyl chloride (100-44-7)	1.9.15
Butyl acetate (123-86-4)	1.14.5
Butylamine (109-73-9)	1.7.8
Butyric acid (107-92-6)	1.14.6
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Carbofuran (1563-66-2)	1.13.22
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Chlorpyrifos (2921-88-2)	1.13.38
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Cresol (1319-77-3)	1.8.14
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Cyclohexane (110-82-7)	1.15.3
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Mexacarbate (315-18-4)	1.13.43
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Monomethylamine (74-89-5)	1.7.12
Naled (300-76-5)	1.13.15
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Nitrotoluene	1.9.19
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Phosgene (75-44-5)	1.12.29
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Strychnine (57-24-9)	1.15.5
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Triethylamine (121-44-8)	1.7.13
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2. INDUSTRY SPECIFIC DATA (VOLUME II)

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Battery Manufacturing	.11.8.2
Coal Mining	.11.3
Coil Coating	.11.8.3
Copper Forming	.NA
Electrical and Electronic Components	.11.8.5
Electroplating	.11.8.7
Explosive Manufacturing.	.11.9.2
Foundries	.11.8.6
Gum and Wood Chemicals	.11.9.3
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Iron and Steel Manufacturing	.11.6
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Metal Finishing.	.11.8.7
Nonferrous Metals Manufacturing	.11.10
Ore Mining and Dressing.	.11.11
Organic Chemicals Manufacturing.	.11.12
Paint and Ink Formulation.	.11.13
Pesticide Manufacturing.	.NA
Petroleum Refining	.11.14
Pharmaceutical Preparation	.11.9.5
Photographic Equipment and Supplies.	.11.8.8
Plastic and Synthetic Materials Manufacturing	.11.12
Plastics Processing	.NA
Porcelain Enameling.	.11.8.10
Pulp and Paperboard.	.11.16
Rubber Processing.	.11.17
Soap and Detergent Manufacturing	.11.18
Steam Electric Power Plants.	.11.19
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NA - Industry not addressed in Volume II of the Treatability Manual at this time. It is anticipated that data will be included when available.

3. TECHNOLOGY SPECIFIC DATA (VOLUME III)

This table is an index of treatment technologies and the location of information available concerning these technologies in the Treatability Manual.

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Diatomaceous earth filtration	III.3.1.9
Distillation.	III.3.1.6
Electrodialysis	III.3.1.7
Evaporation	III.3.1.8
Flocculation.	III.3.1.5
Flotation	III.3.1.10
Mixing	III.3.1.11
Multi media filtration.	III.3.1.9
Oil Separation.	III.3.1.14
Rapid sand filtration	III.3.1.9
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Sedimentation	III.3.1.18
Slow sand filtration.	III.3.1.9
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<u>Chemical Treatment</u>	
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Spray irrigation/land application	III.3.3.3
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Anaerobic digestion	III.4.2
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Drying beds	III.4.3
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4. ANALYSIS QA/QC (VOLUME V)

This index shows the location of information on sampling and analysis methods as well as quality assurance/quality control information in Volume V of the Treatability Manual on an industry basis.

<u>Industry</u>	<u>Treatability Manual</u> <u>Section</u>
Adhesives and Sealants	.V.7.3.17
Aluminum Forming	.V.7.3.7
Auto and Other Laundries	.V.7.3.1
Battery Manufacturing	.V.7.3.8
Coal Mining	.V.7.3.2
Coil Coating	.V.7.3.9
Copper Forming	.V.7.3.10
Electrical and Electronic Components	.V.7.3.11
Electroplating	.V.7.3.13
Explosive Manufacturing	.V.7.3.18
Foundries	.V.7.3.12
Gum and Wood Chemicals	.V.7.3.19
Inorganic Chemicals Manufacturing	.V.7.3.4
Iron and Steel Manufacturing	.V.7.3.5
Leather Tanning and Finishing	.V.7.3.6
Metal Finishing	.V.7.3.13
Nonferrous Metals Manufacturing	.V.7.3.22
Ore Mining and Dressing	.V.7.3.23
Organic Chemicals Manufacturing	.V.7.3.24
Paint and Ink Formulation	.V.7.3.25
Pesticide Manufacturing	.V.7.3.20
Petroleum Refining	.V.7.3.26
Pharmaceutical Preparation	.V.7.3.21
Photographic Equipment and Supplies	.V.7.3.14
Plastic and Synthetic Materials Manufacturing	.V.7.3.27
Plastics Processing	NA
Porcelain Enameling	.V.7.3.16
Pulp and Paperboard	.V.7.3.28
Rubber Processing	.V.7.3.29
Soap and Detergent Manufacturing	.V.7.3.30
Steam Electric Power Plants	.V.7.3.31
Textile Mills	.V.7.3.32
Timber Products Processing	.V.7.3.33

NA - Industry not addressed in Volume V of the Treatability Manual at this time. It is anticipated that data will be included when available.

5. INDUSTRY / SIC CODE DATA (VOLUME II)

This index shows the location of SIC code subcategory information pertaining to a specific industry covered by Volume II of the Treatability Manual.

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7213	11.2.1
7214	11.2.1
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7216	11.2.1
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3646	11.8.5
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<u>Industry</u>	<u>Treatability Manual</u> <u>Section</u>
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3361	11.8.6
3362	11.8.6
3369	11.8.6
<u>Gum and Wood Chemicals</u>	
2861	11.9.3
2869	11.9.3
2865	11.9.3
<u>Inorganic Chemicals Manufacturing</u>	
2812	11.5.1
2813	11.5.1
2816	11.5.1
2819	11.5.1
<u>Iron and Steel Manufacturing</u>	
3312	11.6.1
3315	11.6.1
3316	11.6.1
3317	11.6.1
3479	11.6.1
<u>Leather Tanning and Finishing</u>	
3100	11.7.1
3111	11.7.1
<u>Nonferrous Metals Manufacturing</u>	
333	11.10.1
334	11.10.1

<u>Industry</u>	<u>Treatability Manual</u> <u>Section</u>
<u>Ore Mining and Dressing</u>	
1011	11.11.1
1051	11.11.1
1021	11.11.1
1031	11.11.1
1041	11.11.1
1044	11.11.1
1094	11.11.1
1061	11.11.1
1092	11.11.1
1099	11.11.1
<u>Organic Chemicals Manufacturing</u>	
2865	11.12.1
2869	11.12.1
2821	11.12.1
2823	11.12.1
2824	11.12.1
<u>Paint and Ink Formulation</u>	
2851	11.13.1
2893	11.13.1
27	11.13.1
<u>Petroleum Refining</u>	
2911	11.14.1
1311	11.14.1
<u>Pharmaceutical Manufacturing</u>	
2831	11.9.5
2833	11.9.5
2834	11.9.5
2844	11.9.5
<u>Rubber Processing</u>	
2822	11.17.1
3011	11.17.1
3021	11.17.1
3031	11.17.1
3041	11.17.1
3069	11.17.1
3293	11.17.1
<u>Soap and Detergent Manufacturing</u>	
2841	11.18.1
<u>Steam and Electrical Power Generating</u>	
4911	11.19.1
4931	11.19.1

<u>Industry</u>		<u>Treatability Manual</u>
		<u>Section</u>
<u>Textile Mills</u>		
2299		11.20.1
223		11.20.1
221		11.20.1
222		11.20.1
224		11.20.1
226		11.20.1
2253		11.20.1
2254		11.20.1
2256		11.20.1
2257		11.20.1
2258		11.20.1
2259		11.20.1
225		11.20.1
2252		11.20.1
227		11.20.1
228		11.20.1
2297		11.20.1
2291		11.20.1

6. TECHNOLOGY APPLICATION MATRIX

This matrix summarizes the application status of the wastewater treatment technologies that are included in Volume III of the Treatability Manual. The basis for the establishment of these status categories are the references used in preparing the technology descriptions. A list of these references is included in Volume III and also in Volume V of the Treatability Manual.

[illegible]

○ TECHNOLOGY HAS LIMITED USE

TECHNOLOGY HAS WIDE USE

TECHNOLOGY APPLICATION MATRIX

	4.3 DEWATERING	4.2 THICKENING AND CONDITIONING	4.1 RECYCLING	3.4 LAND APPLICATION	3.3 IMMERSION	3.2 DEEP WELL INJECTION	3.1 THICKENING FILTERS	2.5 ROTATING BIOLOGICAL CONTACTORS	2.4 MINIFICATION/DEMINIFICATION	2.3 LAGOONS	2.2 ACTIVATED SLUDGE	2.1
AUTO AND OTHER LAUNDRIES												
COAL MINING												
INORGANIC CHEMICALS MANUFACTURING												
IRON AND STEEL MANUFACTURING												
LEATHER TANNING AND FINISHING												
METAL FINISHING												
ALUMINUM FORMING												
BATTERY MANUFACTURING												
COIL COATING												
ELECTRICAL AND ELECTRONIC COMP												
FOUNDRIES												
PHOTO EQUIPMENT AND SUPPLIES												
PORCELAIN ENAMELING												
EXPLOSIVES MANUFACTURING												
GUM AND WOOD CHEMICALS												
PHARMACEUTICAL MANUFACTURING												
NONFERROUS METALS MANUFACTURING												
ORE MINING AND DRESSING												
ORGANIC CHEMICALS MANUFACTURING												
PAINT AND INK FORMULATION												
PETROLEUM REFINING												
PULP AND PAPER MILLS												
RUBBER PROCESSING												
SOAP AND DETERGENT MANUFACTURING												
STEAM ELECTRIC POWER PLANTS												
TEXTILE MILLS												
TIMBER PRODUCTS PROCESSING												

* TECHNOLOGY HAS POTENTIAL USE
 ○ TECHNOLOGY HAS LIMITED USE
 ● TECHNOLOGY HAS WIDE USE

7. TECHNOLOGY PERFORMANCE MATRIX

This matrix summarizes the availability of performance data in Volume III of the Treatability Manual, as presented in Technology Data Sheets. The basis for each performance example is included on the Technology Sheet in Volume III.

[illegible]

● TECHNOLOGY DATA SHEET AVAILABLE

TECHNOLOGY PERFORMANCE MATRIX

4.3 DEWATERING	4.3.1	4.3.2	4.3.3	4.3.4	4.3.5	4.3.6	4.3.7	4.3.8	4.3.9	4.3.10	4.3.11	4.3.12	4.3.13	4.3.14	4.3.15	4.3.16	4.3.17	4.3.18	4.3.19	4.3.20	4.3.21	4.3.22	4.3.23	4.3.24	4.3.25	4.3.26	4.3.27	4.3.28	4.3.29	4.3.30	4.3.31	4.3.32	4.3.33	4.3.34	4.3.35	4.3.36	4.3.37	4.3.38	4.3.39	4.3.40	4.3.41	4.3.42	4.3.43	4.3.44	4.3.45	4.3.46	4.3.47	4.3.48	4.3.49	4.3.50	4.3.51	4.3.52	4.3.53	4.3.54	4.3.55	4.3.56	4.3.57	4.3.58	4.3.59	4.3.60	4.3.61	4.3.62	4.3.63	4.3.64	4.3.65	4.3.66	4.3.67	4.3.68	4.3.69	4.3.70	4.3.71	4.3.72	4.3.73	4.3.74	4.3.75	4.3.76	4.3.77	4.3.78	4.3.79	4.3.80	4.3.81	4.3.82	4.3.83	4.3.84	4.3.85	4.3.86	4.3.87	4.3.88	4.3.89	4.3.90	4.3.91	4.3.92	4.3.93	4.3.94	4.3.95	4.3.96	4.3.97	4.3.98	4.3.99	4.3.100	4.3.101	4.3.102	4.3.103	4.3.104	4.3.105	4.3.106	4.3.107	4.3.108	4.3.109	4.3.110	4.3.111	4.3.112	4.3.113	4.3.114	4.3.115	4.3.116	4.3.117	4.3.118	4.3.119	4.3.120	4.3.121	4.3.122	4.3.123	4.3.124	4.3.125	4.3.126	4.3.127	4.3.128	4.3.129	4.3.130	4.3.131	4.3.132	4.3.133	4.3.134	4.3.135	4.3.136	4.3.137	4.3.138	4.3.139	4.3.140	4.3.141	4.3.142	4.3.143	4.3.144	4.3.145	4.3.146	4.3.147	4.3.148	4.3.149	4.3.150	4.3.151	4.3.152	4.3.153	4.3.154	4.3.155	4.3.156	4.3.157	4.3.158	4.3.159	4.3.160	4.3.161	4.3.162	4.3.163	4.3.164	4.3.165	4.3.166	4.3.167	4.3.168	4.3.169	4.3.170	4.3.171	4.3.172	4.3.173	4.3.174	4.3.175	4.3.176	4.3.177	4.3.178	4.3.179	4.3.180	4.3.181	4.3.182	4.3.183	4.3.184	4.3.185	4.3.186	4.3.187	4.3.188	4.3.189	4.3.190	4.3.191	4.3.192	4.3.193	4.3.194	4.3.195	4.3.196	4.3.197	4.3.198	4.3.199	4.3.200	4.3.201	4.3.202	4.3.203	4.3.204	4.3.205	4.3.206	4.3.207	4.3.208	4.3.209	4.3.210	4.3.211	4.3.212	4.3.213	4.3.214	4.3.215	4.3.216	4.3.217	4.3.218	4.3.219	4.3.220	4.3.221	4.3.222	4.3.223	4.3.224	4.3.225	4.3.226	4.3.227	4.3.228	4.3.229	4.3.230	4.3.231	4.3.232	4.3.233	4.3.234	4.3.235	4.3.236	4.3.237	4.3.238	4.3.239	4.3.240	4.3.241	4.3.242	4.3.243	4.3.244	4.3.245	4.3.246	4.3.247	4.3.248	4.3.249	4.3.250	4.3.251	4.3.252	4.3.253	4.3.254	4.3.255	4.3.256	4.3.257	4.3.258	4.3.259	4.3.260	4.3.261	4.3.262	4.3.263	4.3.264	4.3.265	4.3.266	4.3.267	4.3.268	4.3.269	4.3.270	4.3.271	4.3.272	4.3.273	4.3.274	4.3.275	4.3.276	4.3.277	4.3.278	4.3.279	4.3.280	4.3.281	4.3.282	4.3.283	4.3.284	4.3.285	4.3.286	4.3.287	4.3.288	4.3.289	4.3.290	4.3.291	4.3.292	4.3.293	4.3.294	4.3.295	4.3.296	4.3.297	4.3.298	4.3.299	4.3.300	4.3.301	4.3.302	4.3.303	4.3.304	4.3.305	4.3.306	4.3.307	4.3.308	4.3.309	4.3.310	4.3.311	4.3.312	4.3.313	4.3.314	4.3.315	4.3.316	4.3.317	4.3.318	4.3.319	4.3.320	4.3.321	4.3.322	4.3.323	4.3.324	4.3.325	4.3.326	4.3.327	4.3.328	4.3.329	4.3.330	4.3.331	4.3.332	4.3.333	4.3.334	4.3.335	4.3.336	4.3.337	4.3.338	4.3.339	4.3.340	4.3.341	4.3.342	4.3.343	4.3.344	4.3.345	4.3.346	4.3.347	4.3.348	4.3.349	4.3.350	4.3.351	4.3.352	4.3.353	4.3.354	4.3.355	4.3.356	4.3.357	4.3.358	4.3.359	4.3.360	4.3.361	4.3.362	4.3.363	4.3.364	4.3.365	4.3.366	4.3.367	4.3.368	4.3.369	4.3.370	4.3.371	4.3.372	4.3.373	4.3.374	4.3.375	4.3.376	4.3.377	4.3.378	4.3.379	4.3.380	4.3.381	4.3.382	4.3.383	4.3.384	4.3.385	4.3.386	4.3.387	4.3.388	4.3.389	4.3.390	4.3.391	4.3.392	4.3.393	4.3.394	4.3.395	4.3.396	4.3.397	4.3.398	4.3.399	4.3.400	4.3.401	4.3.402	4.3.403	4.3.404	4.3.405	4.3.406	4.3.407	4.3.408	4.3.409	4.3.410	4.3.411	4.3.412	4.3.413	4.3.414	4.3.415	4.3.416	4.3.417	4.3.418	4.3.419	4.3.420	4.3.421	4.3.422	4.3.423	4.3.424	4.3.425	4.3.426	4.3.427	4.3.428	4.3.429	4.3.430	4.3.431	4.3.432	4.3.433	4.3.434	4.3.435	4.3.436	4.3.437	4.3.438	4.3.439	4.3.440	4.3.441	4.3.442	4.3.443	4.3.444	4.3.445	4.3.446	4.3.447	4.3.448	4.3.449	4.3.450	4.3.451	4.3.452	4.3.453	4.3.454	4.3.455	4.3.456	4.3.457	4.3.458	4.3.459	4.3.460	4.3.461	4.3.462	4.3.463	4.3.464	4.3.465	4.3.466	4.3.467	4.3.468	4.3.469	4.3.470	4.3.471	4.3.472	4.3.473	4.3.474	4.3.475	4.3.476	4.3.477	4.3.478	4.3.479	4.3.480	4.3.481	4.3.482	4.3.483	4.3.484	4.3.485	4.3.486	4.3.487	4.3.488	4.3.489	4.3.490	4.3.491	4.3.492	4.3.493	4.3.494	4.3.495	4.3.496	4.3.497	4.3.498	4.3.499	4.3.500	4.3.501	4.3.502	4.3.503	4.3.504	4.3.505	4.3.506	4.3.507	4.3.508	4.3.509	4.3.510	4.3.511	4.3.512	4.3.513	4.3.514	4.3.515	4.3.516	4.3.517	4.3.518	4.3.519	4.3.520	4.3.521	4.3.522	4.3.523	4.3.524	4.3.525	4.3.526	4.3.527	4.3.528	4.3.529	4.3.530	4.3.531	4.3.532	4.3.533	4.3.534	4.3.535	4.3.536	4.3.537	4.3.538	4.3.539	4.3.540	4.3.541	4.3.542	4.3.543	4.3.544	4.3.545	4.3.546	4.3.547	4.3.548	4.3.549	4.3.550	4.3.551	4.3.552	4.3.553	4.3.554	4.3.555	4.3.556	4.3.557	4.3.558	4.3.559	4.3.560	4.3.561	4.3.562	4.3.563
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