New Jersey Drinking Water Quality Institute
Testing Subcommittee
PQL Review, Assessment and Recommendations
March 3, 2009

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Introduction

This document summarizes the results of the Testing Subcommittee review of the A-280 compounds referred by the Health Effects Subcommittee in the memos of December 16, 2005, September 15, 2006, September 14, 2007, April 10, 2008, April 16, 2008 and September 29, 2008. The A-280 compounds are those compounds listed in the 1983 amendments to the New Jersey Safe Drinking Water Act, or A-280 legislation, plus additional chemicals recommended for regulation by the New Jersey Drinking Water Institute (DWQI). Table 1 lists the compounds from these memos in a summary format and is entitled, "A-280 2a and 2b List Compounds Referred to the Testing Subcommittee." The task of the Testing Subcommittee was to evaluate the efficacy of the current Practical Quantitation Limits (PQLs) based on the recent Health Based Maximum Contaminant Level (HB-MCL) reviews conducted by the Health Effects Subcommittee. Technological improvements in analytical methodology and instrumentation are the basis for the triennial PQL review. The Testing Subcommittee is also charged with addressing those A-280 contaminants for which PQLs have not been previously developed. The PQL review of thirty-one A-280 referred compounds was initiated in January 2006 and was completed in January 2009. The Testing Subcommittee's PQL recommendations to the full DWQI regarding each A-280 compound are listed in Table 18, "The Testing Subcommittee A-280 PQL Review Results."

Background

The DWQI, in their original 1987 document (DWQI, 1987), made several proposals regarding their function as an advisory group. Among these proposals, the DWQI recommended that the A-280 contaminants be reviewed on a triennial basis. The intention of this periodic assessment was to assure that the Maximum Contaminant Levels (MCLs) reflect the best available information for the effective health protection of New Jersey citizens and visitors. This document addresses the Testing Subcommittee's role in the completion of the DWQI Workplan Item II (DWQI Workplan).

The DWQI Workplan requires the review of the A-280 compounds which includes: 1) the 2a compounds, those chemicals listed in Section 2a of the 1983 amendments to the New Jersey Safe Drinking Water Act, or A-280 legislation; 2) the regulated 2b compounds, the additional contaminants the DWQI chose to regulate in drinking water in 1994 under Section 2b of the A-280 legislation; 3) the 2b compounds for which the DWQI previously developed HB-MCLs, the additional contaminants for which a MCL is currently under development; and 4) those 2b contaminants of concern which were added to the Workplan since the last review. To accomplish this goal, review of updated toxicological studies by the Health Effects Subcommittee and research into the improvements in analytical quantification capability by the Testing Subcommittee were required. Based on the findings of both Subcommittees, modifications to existing HB-MCLs and/or PQLs may result. Upon further consideration by the full DWQI, these modifications may dictate a change in MCLs.

Six (6) memos from the Health Effects Subcommittee to the DWQI Chairperson referred a total of thirty-one A-280 chemicals to the Testing Subcommittee for PQL review (see Table 1). In addition to those thirty-one chemicals, the Health Effects Subcommittee (as per their memo of

September 29, 2008) suggested that the Testing Subcommittee begin to research available analytical methods for tertiary butyl alcohol (TBA) and total and hexavalent chromium.

In the first memo dated December 16, 2005, the Health Effects Subcommittee stated that they were not recommending changes to ten HB-MCLs: eight 2a compounds and two 2b compounds. Table 1 lists these compounds (Items 1 through 10) with referral dates noted. (The Table 1 headings, Current HB-MCLs and Current PQLs, are those values that had been sanctioned by the DWQI as a result of the last A-280 review (DWQI, 1994). The "Current MCLs" are the regulatory values presently used that may be replaced by new MCL values only after their recommendation by the DWQI to the Commissioner and subsequent adoption by rule. The column heading, "Health Based Guidance" lists values developed either by the NJDEP Division of Science, Research and Technology (DSRT), as in the case of 1,2,3-trichloropropane, or by the EPA, as in the case of dacthal. These values were used as health advisories in providing guidance to water systems should detections of these compounds occur.) Since the HB-MCLs for each of these ten compounds are greater than their respective PQLs, the Health Effects Subcommittee stated in the memo that a PQL review of these ten A-280 compounds would not be necessary. In a subsequent memo dated September 29, 2008, the Health Effects Subcommittee re-evaluated the HB-MCL for 1,1,1-trichloroethane based on new data which resulted in an increase in the HB-MCL. Again, because the new HB-MCL was much higher than the current PQL, review of the PQL for this compound was discretionary.

In the December 16, 2005 memo, the Health Effects Subcommittee also referred five 2a compounds (Items 11 through 15 on Table 1) for PQL review. The HB-MCLs for these five 2a compounds remained the same, but since the existing MCLs are greater than the HB-MCLs, either analytical or treatment issues were the limiting factors in establishing their MCLs. For these compounds, the Testing Subcommittee updated the PQLs by reviewing current methodology and analytical data. Two other 2a compounds, n-hexane and formaldehyde, (Items 16 and 17 on Table 1) were referred by the Health Effects Subcommittee in this memo. These compounds, because of uncertainty in analytical detection capability and treatment removal efficiency, currently do not have MCLs. The Testing Subcommittee investigated recent technological advances in the analysis of these chemicals.

The second referral memo from the Health Effects Subcommittee was dated September 15, 2006. After the Health Effects Subcommittee review, the HB-MCLs for four compounds (Items 18 through 21 on Table 1) were reduced to levels below their current PQL, thereby requiring a PQL review by the Testing Subcommittee. In addition to these changes, the memo also listed five additional compounds (Items 22 thru 26 on Table 1) for which the new HB-MCLs are greater than the current PQLs. For this reason, the Health Effects Subcommittee left it to the discretion of the Testing Subcommittee to determine whether a PQL evaluation would be performed for these five compounds.

In a memo dated December 1, 2006, the Testing Subcommittee referred these five compounds (Items 22 through 26 on Table 1) to the Treatment Subcommittee without performing a PQL review. Upon reconsideration, the Testing Subcommittee decided to conduct a PQL evaluation for these five VOCs. This allows for consistency and also demonstrates the ability of laboratories to achieve lower PQLs. The result of this evaluation was a lowering of the PQLs for four of the

five previously referred compounds (Items 22, 23, 25 & 26): 1,3-dichlorobenzene was lowered to 1 µg/L from 5µg/L; 1,4-dichlorobenzene was lowered to 1 µg/L from 5 µg/L; 1,1,-dichloroethene was lowered to 0.9 µg/L from 2 µg/L and 1,2,4-trichlorobenzene was lowered to 1 µg/L from 5 µg/L. The PQL for 1,1-dichloroethane remained at 1 µg/L. A memo dated December 17, 2008 from the Testing Subcommittee, retracted the previously recommended PQLs for the four VOCs mentioned above and also referred six additional A-280 contaminants to the Treatment Subcommittee for review.

Five additional A-280 contaminants (Items 27 through 31 on Table 1) were referred by the Health Effects Subcommittee for PQL review. These A-280 chemicals, were ethylene glycol (referred in a memo dated September 14, 2007), dacthal and its degradates (referred in a memo dated April 10, 2008), 1,2,3-trichloropropane (referred in a memo dated April 16, 2008) and methyl ethyl ketone, 1,1,1-trichloroethane and 2,4,6-trichlorophenol (referred in a memo dated September 29, 2008). The September 29, 2008 memo also listed the new HB-MCL for 1,1,1-trichloroethane which was discussed earlier. The PQL recommendations for four of these five A-280 contaminants (Items 27 through 30 on Table 1) are included in this document (see Table 18). Although a range of values for the final HB-MCL for 1,2,3-trichloropropane (123TCP) was referred from the Health Effects Subcommittee, the Testing Subcommittee was requested to begin researching data on 123TCP. In 1999, a health-based drinking water guidance of 0.005 µg/L was developed by the DSRT. This value served as guidance for recommendations in situations where concentrations of 123TCP were detected in drinking water at or above 0.005 µg/L. A HB-MCL for 123TCP is in the process of development and is anticipated to be established somewhere in the range of 0.0015µg/L to 0.009 µg/L. Due to its toxicity, 123TCP is anticipated to be included in the New Jersey Safe Drinking Water Regulations update expected in 2009. The PQL review of 123TCP took precedence over the last referred chemical, 2,4,6-trichlorophenol. The 2,4,6-trichlorophenol PQL review will be deferred and will not be addressed in this document.

The Testing Subcommittee convened nine times for the A-280 PQL review of the chemicals listed in Table 1. The Testing Subcommittee met on the following dates: 1/24/2006, 5/2/2006, 9/13/2006, 11/28/2006, 2/15/2007, 6/21/2007, 12/11/2007, 4/17/2008 and 1/14/2009. Staff from the New Jersey Department of Environmental Protection (NJDEP) Bureau of Safe Drinking Water (BSDW), Office of Quality Assurance (OQA) and Division of Science, Research and Technology (DSRT) contributed to the investigation of the occurrence and analytical capability of various methods for these chemicals.

Table 1 A-280 2a and 2b List Compounds Referred to the Testing Subcommittee

No.	A-280 Compound	Type A-280	Current Health-Based MCL (µg/L)	Current Health-Based Guidance (µg/L)	Current MCL (µg/L)	Current PQL (µg/L)	New Health-Based MCL (µg/L)	Referral Memo Date from the Health Effects Subcommittee
1	Chlorobenzene	2a	50		50	2	No Change	12/16/05
2	1,2-Dichlorobenzene	2a	600		600	2	No Change	12/16/05
3	cis-1,2-Dichloroethene	2a	70		70	2	No Change	12/16/05
4	trans-1,2-Dichloroethene	2a	100		100	2	No Change	12/16/05
5	Methylene Chloride (1)	2a	2.5		3	2	No Change	12/16/05
6	1,1,1-Trichloroethane(2)	2a	26		30	1	1960	12/16/05 & 09/29/08
7	Trichloroethene	2a	1.2		1	1	No Change	12/16/05
8	Xylenes	2a	1000		1000	2	No Change	12/16/05
9	MTBE	2b	70		70	1	No Change	12/16/05
10	Naphthalene	2b	300		300	2	No Change	12/16/05
11	Carbon Tetrachloride	2a	0.39		2	2	No Change (3)	12/16/05
12	Chlordane	2a	0.013		0.5	0.5	No Change (3)	12/16/05
13	PCBs	2a	0.02		0.5	0.5	No Change (3)	12/16/05
14	Tetrachloroethene	2a	0.44		1	1	No Change (3)	12/16/05
15	1,2-Dichloroethane	2a	0.29		2	2	No Change (3)	12/16/05
16	n-Hexane	2a	33		None	5	No Change (3)	12/16/05
17	Formaldehyde	2a	100		None	41	No Change (3)	12/16/05
18	Benzene	2a	0.15		1	1	0.1	9/15/06
19	1,1,2,2-Tetrachloroethane	2b	1		1	1	0.2	9/15/06
20	1,1,2-Trichloroethane	2b	3		3	2	0.6	9/15/06
21	Vinyl Chloride	2a	0.084		2	5	0.023	9/15/06
22	1,3-Dichlorobenzene	2a	600		600	5	6	9/15/06
23	1,4-Dichlorobenzene	2a	150		75	5	14	9/15/06
24	1,1-Dichloroethane	2b	46		50	1	23	9/15/06
25	1,1-Dichloroethene	2a	1		2	2	7	9/15/06
26	1,2,4-Trichlorobenzene	2a	8.6		9	5	18	9/15/06
27	Ethylene Glycol	2a	290		None	None	10,000	9/14/07
28	Dacthal and degradates	2b	None	70	None	None	28	4/10/08
29	1,2,3-Trichloropropane	2b	None	0.005	None	None	0.0013	4/16/08
30	Methyl Ethyl Ketone	2a	270		None	20	4000	9/29/08
31	2,4,6-Trichlorophenol	2b	1		None	None	3	9/29/08

(1) A review for methylene chloride was not required, however since the review was performed, the outcome of the review is included with the recommendations in this document.
(2) The Health Effects Subcommittee referred this compound to the Testing Subcommittee in the December 16, 2005 memo recommending no change in the HB-MCL. In a memo dated September 29, 2008 the Health Effects Subcommittee recommended raising the HB-MCL from 26 µg/L to 1960 µg/L.
(3) The Health Effects Subcommittee suggested that the Testing Subcommittee review the current PQLs because either the existing HB-MCL is lower than the MCL or no MCL has been established.

Practical Quantitation Level Assessment

In the initial stage of the PQL review, the Testing Subcommittee grouped those A-280 contaminants that had been referred by that point, into three categories. This helped establish a consistent procedure for reviewing analytical data and methodology and allowed for the appropriate distribution of research tasks among the subcommittee members. Later on in the PQL review process, other A-280 compounds subsequently referred from the Health Effects Subcommittee, such as ethylene glycol, dacthal (and degradates), and 1,2,3-trichloropropane, were reviewed individually.

The **Group 1** compounds consisted of volatile organic compounds (VOC) which are target analytes in the two United States Environmental Protection Agency (EPA) approved drinking water methods, 524.2 and 502.2. VOC method detection limits (MDL) test results obtained from the Safe Drinking Water Information System (SDWIS)[1]and the Private Well Testing Act (PWTA) databases were used as sources of performance data for the PQL development process for both the chlorinated and unchlorinated VOCs. The PQLs were calculated by multiplying the average median MDL, reported by laboratories conducting drinking water VOC analyses, by a factor of 5. This convention has been used since the original review of these compounds by the DWQI Testing Subcommittee (DWQI, 1987). This approach was further substantiated based on a NJDEP research project (Eaton, et. al., 1993), whereby it was determined that a multiplier between four and six could be used to yield a supportable PQL value. The Testing Subcommittee in both DWQI A-280 documents (1987 and 1994) utilized five as a multiplier for the PQL. Likewise, the NJDEP's Ground Water Quality Standards use the factor of five times the median MDL to arrive at a PQL. Since 1987, the use of five as a factor in setting PQLs has been the accepted convention in the NJDEP.

Improvements in laboratory testing performance and instrumentation which affect the achievement of lower MDLs were the most significant factors in the re-evaluation of the PQLs for these VOCs. MDLs from the most recent three year compliance period (2005-2007) were used in the median MDL determination for these compounds.

The **Group 2** chemicals, polychlorinated biphenyls (PCBs) and chlordane, are composed of synthetic organic compounds (SOCs). Rather than single regulated organic compounds, isomers exist for the compound classes of polychlorinated biphenyls and chlordane. State-wide monitoring waivers for these chemicals have been issued to all community water systems and nontransient noncommunity water systems since 1995. These waivers exempt public water systems from SOC compliance sampling for the waivered compounds. The basis and justification for the waivers is documented in *Technical Criteria Document for Statewide and Countywide Waivers* (NJDEP, DSRT July 1994). Because of these waivers, the amount of recent drinking water data for

[1] The Safe Drinking Water Data System prior to 2004 was mainframe-based. For the purposes of this report, the database for public water systems, past and present, will be referred to by its current name: Safe Drinking Water information System or SDWIS.

chlordane and PCBs are limited. It was the consensus of the Testing Subcommittee that the current method that is utilized for routine monitoring for PCBs was inadequate to detect this class of compounds at ambient levels. The Testing Subcommittee determined that analytical capability for PCBs has sufficiently matured to investigate a limited number of vulnerable public water supplies detailed later in the text.

Group 3 consists of n-hexane and formaldehyde, both 2a contaminants for which the DWQI had not established MCLs due to lack of treatment capability data and in the case of formaldehyde, available EPA approved test methodologies. Their HB-MCLs and PQLs were recorded in the 1994 DWQI document. Since neither compound is regulated or a target analyte in a method used for compliance monitoring, data were unavailable in the SDWIS database and subsequently, other sources of occurrence data were obtained for their review.

Group 1: Volatile Organic Compounds

Fifteen A-280 volatile organic compounds were evaluated as a group for the determination of PQLs. These fifteen chemicals are both 2a compounds (benzene, vinyl chloride, methylene chloride, 1,2-dichloroethane, 1,1-dichloroethene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, tetrachloroethene (PCE), carbon tetrachloride, 1,2,4-trichlorobenzene, methyl ethyl ketone (MEK), and 1,1,1-trichloroethane) and 2b compounds (1,1,2,2-tetrachloroethane, 1,1-dichloroethane and 1,1,2-trichloroethane). All compounds but MEK, are regulated and therefore routinely monitored by community and nontransient noncommunity water systems as part of the Safe Drinking Water Act (SDWA) regulations. Data collected as part of the regulatory requirements of the Safe Drinking Water Act and Private Well Testing Act (PWTA) were available from both databases for these fourteen regulated compounds.

The Testing Subcommittee followed the same procedure for the determination of PQLs for each of these 15 VOCs, regardless of whether the HB-MCL changed or remained the same. The PQL was determined by multiplying the average median MDL (reported by laboratories) by a factor of 5. This was the convention used in the 1987 initial determination of PQLs for many of these same A-280 compounds (DWQI, 1987). According to the 1987 document, the laboratories reporting drinking water data often used the MDLs published in the United States Environmental Protection Agency (EPA) analytical methods rather than determining their own by using the procedure defined in 40 CFR Part 136, Appendix B. Following the procedures set forth in 40 CFR Part 136, Appendix B, laboratories certified by the NJDEP are now required to calculate and report to the State their MDLs[2]on an annual basis.

[2] During this PQL review and development process, the Testing Subcommittee would like to acknowledge the ongoing work being done by various groups including the EPA in addressing the issue of the MDL process, its relationship to quantitation limits and possible alternatives. The Testing Subcommittee will continue to monitor developments in this area. As this process draws to a more definitive conclusion, the Testing Subcommittee may incorporate new approaches to the development of PQLs.

The federal Safe Drinking Water Act Regulations, adopted by New Jersey by reference, require the MDLs of regulated VOCs be less than or equal to 0.5 µg/L. It also states that a resulting concentration of a regulated VOC greater than 0.5 µg/L is considered a detection. Because of this provision in the VOC regulations, the regulatory maximum MDL of 0.5 µg/L serves as a method reporting limit (MRL) for VOCs. Laboratories, when submitting Safe Drinking Water compliance VOC data, will report a non-detect as less than either 0.5µg/L or the laboratory's calculated MDL for that particular analyte. Therefore, the MDLs from most labs can be obtained from either the SDWIS database or the PWTA database. In those cases where the laboratories did not report their calculated MDL, the Testing Subcommittee acquired these values directly from the laboratories.

The procedure followed in the determination of the median MDL for each VOC is as follows:

1) The Testing Subcommittee used the MDLs of the laboratories which submit:

a) 80% of the total amount of EPA Method 524.2 SDWIS data from 2002 through 2007 (two complete three-year federal Safe Drinking Water compliance periods),

b) 80% of the total amount of EPA Method 524.2 Private Well Testing Act (PWTA) data from 2004 through 2007,

c) 80% of the total amount of EPA Method 502.2 SDWIS data from 2002 through 2007 (two complete three-year federal Safe Drinking Water compliance periods), and

d) 80% of the total amount of EPA Method 502.2 PWTA data from 2004 to through 2007.

2) The MDLs used by each of these laboratories were separated by method, year and program, (SDWIS or PWTA). MDLs were obtained from the SDWIS database for the public water systems and from the Private Well Testing Act database for the private well data. When submitting VOC data to the NJDEP, Bureau of Safe Drinking Water, some laboratories enter the MDLs for each of the regulated VOCs as 0.5 µg/L. Upon request, laboratories faxed or emailed their true MDLs to the Bureau of Safe Drinking Water.

3) The MDLs considered were those used during the last complete three-year compliance period of January 1, 2005 to December 31, 2007. During each three-year compliance period, all community and nontransient noncommunity water systems (providing their own source of water) must sample at least once and sometimes more than once. Also considered during this timeframe were the MDLs used by laboratories analyzing samples for the PWTA. The MDLs were separated by year, method and program.

4) The Testing Subcommittee utilized only the EPA Method 524.2 MDLs rather than both 502.2 and 524.2 EPA method MDLs. The reasoning for this decision is as follows:

a) Approximately 20 percent of the total number of MDLs for each analyte were EPA Method 502.2 MDLs, and

b) There has been a decrease in the number of laboratories maintaining their New Jersey laboratory certification for EPA Method 502.2.

5) The first step in the determination of the average median MDL for each contaminant was determining the median MDL for each contaminant for each year: 2005, 2006 and 2007. If laboratories analyzed VOCs for both SDWA and PWTA programs the MDL used for both programs was counted once. The average median MDL was calculated by averaging the median MDLs for 2005, 2006 and 2007. The data used for the determination of the average median MDL for each of these 15 volatile organic compounds are contained in Appendix A. In Appendix A, the MDL values used by a specific laboratory for both the SDWA and PWTA programs are indicated with an underscore.

In the interest of establishing consistency in proposing PQLs, the Testing Subcommittee made a decision to round the product of the average median MDL (which is 2 significant figures) and the factor 5 to the nearest one significant figure (not necessarily a whole number). Applying the factor of 5 to the average median MDL for benzene, carbon tetrachloride, 1,1-dichloroethene and 1,1,1-trichloroethane result in values of 0.75, 0.85, 0.90 and 0.90 respectively. Upon applying the common rounding rules, the PQLs for these VOCs become 0.8 μg/L, 0.9 μg/, 0.9 μg/L and 0.9 μg/L respectively. Hereon, these steps will determine the numerical value of the proposed PQLs. Greater sensitivity of instrumentation and improvements in laboratory testing performance is driving lower MDLs often resulting in PQLs less than 1 μg/L.

An optimum situation occurs when PQLs can be established at values less than or equal to the HB-MCL. The proposed PQLs for benzene and carbon tetrachloride lessen the gap between the PQL and the HB-MCL and will result in a proposed MCL closer the HB-MCL. Since 1,1-dichloroethene and 1,1,1-trichloroethane have HB-MCLs higher than the PQLs, their MCLs will not be influenced by the lower PQLs.

The current PQLs for the VOCs, methyl ethyl ketone (MEK) and 1,1,1-trichloroethane (111-TCA) are lower than the current HB-MCLs. The Health Effect Subcommittee's review of the HB-MCLs for both compounds resulted in higher HB-MCLs. Both MEK and 111-TCA are target analytes in the approved VOC drinking water methods 524.2 and 502.2. However, because MEK is not regulated and the PWTA database accepts only regulated VOCs, MEK's average median MDL was derived from SDWIS data exclusively. The recommended PQLs for MEK and 111-TCA are found in Table 2, Results of VOC PQL Review.

Table 2
Results of VOC PQL Review

VOC	Type A-280	HBL (µg/L)	Revised HBL (µg/L)	PQL (µg/L)	Average Median MDL (µg/L)	5 x MDL*	Recommended PQL (µg/L)	PQLΔ Y/N	MCL (µg/L)	EPA MCL (µg/L)	1993 GWQS** PQL (µg/L)	2005 GWQS PQL (µg/L)
Benzene	2a	0.15	0.1↓	1	0.15	0.75	**0.8**	Y	1	5	1	1
Carbon Tetrachloride	2a	0.39	N	2	0.17	0.85	**0.9**	Y	2	5	2	1
1,2-Dichloroethane	2a	0.29	N	2	0.19	0.95	**1**	Y	2	5	2	2
Tetrachloroethene	2a	0.44	N	1	0.19	0.95	**1**	N	1	5	1	1
Vinyl Chloride	2a	0.084	0.023↓	5	0.20	1.00	**1**	Y	2	2	5	1
1,1,2,2-Tetrachloroethane	2b	1	0.2↓	1	0.23	1.15	**1**	N	1	none	1	1
1,1,2-Trichloroethane	2b	3	0.6↓	2	0.24	1.20	**1**	Y	3	5	2	2
1,3-Dichlorobenzene	2a	600	6↓	5	0.20	1.00	**1**	Y	600	none	5	5
1,4-Dichlorobenzene	2a	150	14↓	5	0.20	1.00	**1**	Y	75	75	5	5
1,1-Dichloroethane	2b	46	23↓	1	0.19	0.95	**1**	N	50	none	1	1
1,1-Dichloroethene	2a	1	7↑	2	0.18	0.90	**0.9**	Y	2	7	2	1
1,2,4-Trichlorobenzene	2a	8.6	18↑	5	0.26	1.30	**1**	Y	9	70	1	1
Methylene Chloride	2a	2.5	N	2	0.22	1.10	**1**	Y	2	5	2	1
1,1,1-Trichloroethane	2a	26	1960	1	0.18	0.90	**0.9**	Y	30	200	1	1
Methyl Ethyl Ketone	2a	270	4000	20	0.46	2.30	**2**	Y	none	none	NA	2

*This value rounded to the nearest one significant number is the Recommended PQL
**Ground Water Quality Standard

Group 2: Chlordane and PCBs

Chlordane

Most community and nontransient noncommunity water systems have been issued New Jersey statewide waivers for chlordane due to several considerations: 1) the use of chlordane in agriculture had been banned by the USEPA since the early 1970s and its use for pest control was banned in 1988, and 2) a study of its fate and transport in the environment determined that chlordane has a propensity to adhere to solids and therefore would be less likely to be found in the aqueous phase (*Technical Criteria Document for Statewide and Countywide Waivers*) (NJDEP,DSRT July 1994).

Chlordane has a PQL of 0.5 µg/L (DWQI, 1987). The HB-MCL of 0.013µg/L was developed in 1987 (CAS # 57-74-9) for a mixture of the isomers alpha chlordane and gamma chlordane, the main components of chlordane. The New Jersey State Environmental Laboratory, Environmental and Chemical Laboratory Services (ECLS), formerly referred known as the New Jersey Department of Health and Senior Services Laboratory (NJDOHSS), analyzes alpha and gamma chlordane using either EPA Method 505 or 525.2. The ECLS MDLs and the lowest calibration standard for each method are listed in Table 3, Chlordane Data from Environmental and Chemical Laboratory Services.

Table 3*
Chlordane Data from Environmental and Chemical Laboratory Services

EPA Method	Alpha Chlordane (ug/L)	Gamma Chlordane (ug/L)
505 MDL	0.023	0.016
505 Lowest Calibration Standard	0.04	0.04
525.2 MDL	0.033	0.026
525.2 Lowest Calibration Standard	0.10	0.10

*Information from 2006

The New Jersey SOC Waiver Program requires sampling of vulnerable community and nontransient noncommunity water systems for regulated SOCs during every three-year compliance period. This sampling is performed by the Bureau of Safe Drinking Water Technical Assistance. The SDWIS database contains 160 samples analyzed for alpha and gamma chlordane from 1994 to present. Most of the data for alpha and gamma chlordane were obtained through the New Jersey SOC Waiver Program. None of the 160 samples contained detectable concentrations of either alpha or gamma chlordane. For the purposes of the New Jersey SOC Waiver Program, EPA 525.2 was the analytical method chosen for chlordane analysis. During the period of 2000 to 2006, the EPA 525.2 MDLs for

alpha chlordane ranged from 0.033 to 0.052 μg/L. The MDLs for gamma chlordane ranged from 0.026 to 0.046 μg/L.

The DWQI recommended, and the NJDEP adopted in 1989, an MCL of 0.5 ug/L for chlordane. The Testing Subcommittee recommends retaining 0.5 μg/L as the PQL due to chlordane fate and transport characteristics, the lack of any significant advances in the analysis of chlordane and the absence of chlordane detections in New Jersey waters.

PCBs

As discussed above, most community and nontransient noncommunity water systems were issued state-wide waivers from monitoring for PCBs. The justification for these waivers is presented in *Technical Criteria Document for Statewide and Countywide Waivers* (NJDEP, DSRT, July 1994). PCBs mostly adhere to soil, however, each of the 209 congeners have different soil mobility coefficients and water solubilities. The HB-MCL for PCBs is 0.020 μg/L (20 nanograms per liter [ng/L]). As a result of the Health Effects Subcommittee review, this HB-MCL of 0.020 μg/L will remain the same.

In accordance with the federal Safe Drinking Water Act regulations, certain methods are approved for analysis of PCBs. Over past years, the MDLs for PCBs (using approved drinking water methods) have not changed significantly and are still several orders of magnitude higher than the PCB HB-MCL of 20 ng/L established by the DWQI. To ensure that PCBs do not exist in New Jersey drinking waters at levels near or above this HB-MCL and to assist in determining the necessity of regulating PCBs at the HB-MCL, the Testing Subcommittee requested that the NJDEP Bureau of Safe Drinking Water Technical Assistance (BSDWTA) conduct a screening survey of New Jersey's most vulnerable drinking water sources. During its review of current available testing technologies, the Testing Subcommittee researched analytical methods capable of quantifying PCBs as close as possible to this HB-MCL. One such method, EPA method 1668A, *Chlorinated Biphenyl Congeners in Water, Soil and Sediments*, was found to be more sensitive and capable of identifying and quantitating each of the possible 209 PCB congeners. This method is an isotope dilution method which will allow the estimation of total PCBs in a sample by summation of the concentrations of the PCB congeners and congener groups. This method has published Estimated Method Detection Limits (EMDLs for the 209 congeners ranging from 0.004 ng/L to 0.455 ng/L. The Estimated Minimum Levels (EMLs of the congeners range from 0.200 ng/L to 1 ng/L.

The NJDEP Bureau of Safe Drinking Water Technical Assistance drafted a Quality Assurance Project Plan (QAPP) entitled, *Determination of Chlorinated Biphenyl Congeners in Drinking Water Samples.* It describes a BSDW initiative for screening approximately 12 vulnerable drinking water source locations in New Jersey for PCBs. EPA method 1668A will be the method used for the analysis of the samples. Control sites where PCBs were not expected to be present were also chosen. These locations were determined based upon historical knowledge of water systems. In addition, the document, *Characterization of Tentatively Identified Compounds in Samples from Public Water Systems in NJ* (March 2003, NJDEP) aided in the choice of sampling locations. Due to

resource constraints within the NJDEP, this study will be performed sometime in the future. The Testing Subcommittee is retaining the current PQL for PCBs of 0.5 µg/L until the PCB study is completed and data is available. At that time, the Testing Subcommittee will address updating the PQL for PCBs.

Group 3: n-Hexane and Formaldehyde

n-Hexane

n-Hexane, a non-carcinogenic VOC, has a HB-MCL of 33 µg/L established with the original A-280 review (DWQI, 1987). Upon referral by the Health Effects Subcommittee for PQL review, the HB-MCL remained unchanged. The current PQL of 5 µg/L was developed by multiplying the DWQI 1994 documented EPA Method 524.2 MDL of 1 µg/L by the factor 5. In the DWQI 1994 document, the Testing Subcommittee recommended that n-hexane be incorporated into EPA Method 524.2 and recommended that this method along with a method developed by Battelle (Eaton, et. Al 1991) be used for the analysis of n-hexane. Due to lack of treatment feasibility data and its classification as a noncarcinogen, a MCL for n-hexane was not recommended by the DWQI.

Since n-hexane is neither a regulated VOC nor a target analyte in EPA 524.2, data for n-hexane were unavailable in the SDWIS database. Several laboratories, however, have incorporated n-hexane into their VOC analytical method through the addition of an n-hexane standard. Such laboratory information was available from the NJDEP Site Remediation program and consisted of n-hexane data derived from three methods. The MDLs from samples analyzed using a modified EPA Method 524.2 ranged from 0.061 to 0.71 µg/L. The other methods, EPA 624 and SW-846, 8260B, are not specific drinking water methods and were found to yield detection limits of at least an order of magnitude higher than what is required for compliance sampling under the Safe Drinking Water Act.

According to the federal Safe Drinking Water Regulations both EPA 524.2 and EPA 502.2 are approved VOC methods for the analysis of public water system compliance samples. EPA 502.2 is a gas chromatography (GC) method which utilizes a Photoionization Detector (PID) and an Electron Capture Detector (ECD). Neither of these detectors is capable of detecting n-hexane due to its structure as a saturated straight chain hydrocarbon. Therefore, this method is not amenable for the analysis of n-hexane in drinking water. EPA 524.2 is a GC method which uses a mass spectrometer as the detector. At the request of the Testing Subcommittee, the Environmental and Chemical Laboratory Services laboratory (ECLS), incorporated n-hexane into the EPA Method 524.2 and used 0.5 µg/L as their lowest calibration standard for n-hexane. The addition of n-hexane standard was applied to two ECLS 524.2 instruments.

Based upon the EPA Method 524.2 studies conducted by ECLS, the Testing Subcommittee forwarded a memorandum to Dr. Mark Robson on June 8, 2007 recommending a PQL of 2 µg/L for n-hexane. After further discussion, the Testing Subcommittee reconsidered basing the PQL on the average of the two MDLs from ECLS.

The federal Safe Drinking Water regulations require that regulated VOCs have MDLs no greater then 0.5 μg/L. With its inclusion in the suite of regulated VOCs, this regulatory MDL will be applicable to n-hexane. The ECLS data support the addition of n-hexane as the lowest calibration standard at 0.5 μg/L. The Testing Subcommittee is recommending a PQL for n-hexane based on 5 times the maximum allowed MDL value of 0.5 μg/L, which when rounded to one significant figure is 3 μg/L. Since the HB-MCL is an order of magnitude higher than the PQL and currently there is little MDL information for n-hexane, it is reasonable to round the PQL to 3 μg/L. A memo from the Testing Subcommittee dated December 17, 2008 retracted the previous PQL proposal of 2 μg/L and replaced it with the value of 3 μg/L.

The Testing Subcommittee recommendation will also require that the NJDEP incorporate n-hexane analysis by EPA method 524.2 into their laboratory certification program. In 2008, approximately 75 laboratories applied for New Jersey certification in order to analyze VOCs for Safe Drinking Water Act compliance samples and/or the PWTA sampling requirements. Of these certified labs, 15 percent hold certification in both 502.2 and 524.2; 78 percent run 524.2 exclusively; and 7 percent run 502.2 exclusively. Most laboratories are not renewing their 502.2 certification and are electing to use 524.2 exclusively for VOCs. One New Jersey certified laboratory only runs 502.2 and submits approximately 8 percent of all the PWTA data. Once n-hexane is regulated, EPA Method 502.2 will no longer be an approved VOC method for New Jersey public water systems or the PWTA. Laboratories analyzing VOCs for SDWA and PWTA by 502.2 will be required to obtain New Jersey certification with EPA method 524.2 in order to continue analyzing New Jersey regulatory VOC samples.

Formaldehyde

Formaldehyde is produced as a result of disinfecting drinking water with ozone or chlorine dioxide and is therefore considered a disinfection by-product (DBP). It has a HB-MCL of 100 μg/L. Its last documented PQL is 41 μg/L (DWQI, 1994).

In the original review of A-280 contaminants (DWQI, 1987) a drinking water MCL for formaldehyde was not developed due to the lack of any validated standardized analytical methods. In 1987, NJDEP contracted Battelle Laboratories to refine a formaldehyde method which was initially developed at the Rutgers University Department of Environmental Studies Laboratory. To evaluate and validate the Rutgers/Battelle method, NJDEP contracted with Research Triangle Institute. Research Triangle Institute suggested improvements with the procedure's high background level of formaldehyde. Research Triangle Institute's MDL, using this refined method, was 17 μg/L. However, at about the same time, the EPA developed Method 554 for the analysis of formaldehyde. The EPA 554 MDL was 8.1 μg/L. This information is presented in Table 4, Methods Used Since 1989 in the Analysis of Formaldehyde in Drinking Water.

The PQL of 41 μg/L listed in the 1994 DWQI document was derived by multiplying the EPA 554 MDL (8.1 μg/L) by 5. Since the PQL of 41 μg/L is below the HB-MCL of 100 μg/L, the PQL was not the limiting factor for establishing an MCL for formaldehyde. In

the 1994 DWQI document, the DWQI Program Subcommittee (the former name of the DWQI Treatment Subcommittee) recommended that an MCL not be established for formaldehyde due to the lack of adequate treatment for formaldehyde removal.

Table 4
Methods Used Since 1989 in the Analysis of Formaldehyde in Drinking Water

Method	History	Technique	MDL (µg/L)
Battelle Draft	1989	HPLC/DNPH	30
Battelle Draft with RTI Modifications	1989	HPLC/DNPH	17
EPA 554	1989	HPLC/DNPH	6.2[(a)] 8.1[(b)]
SM 6252B	1999	PFBHA GC/ECD or GC/SIM-MS	1.4
EPA 556	1998	PFBHA, GC/ECD	0.36
EPA 556.1	1999	FGC/ECD	0.09

(a) Published MDL for reagent water
(b) Published MDL for dechlorinated tap water

KEY:
HPLC: High Pressure Liquid Chromatography
DNPH: Dinitrophenol Hydrazine
RTI: Research Triangle Institute
GC/ECD: Gas Chromatography Electon Capture Detector
PFBHA: Pentafluorobenzylhydroxylamine
GC/SIM-MS: Gas Chromatography/Selective Ion Monitoring- Mass Spectrometry
FGC: Fast Gas Chromatography

At the time of the second review of the A-280 compounds in 1994, formaldehyde occurrence data in drinking water were still not available. Since formaldehyde is not required to be monitored, there were no additional results submitted to NJDEP for compliance purposes. Therefore, the Testing Subcommittee obtained data from other sources. The Federal Information Collection Rule (ICR) of 1996 required systems that disinfect with ozone or chlorine dioxide to monitor for aldehydes, which included analyses for formaldehyde. A copy of the ICR data was obtained from the EPA in order to review the national formaldehyde results. Other, more recent, formaldehyde data were obtained from New Jersey community water systems that either ozonate or use chlorine dioxide and periodically monitor for aldehydes.

Information Collection Rule (ICR)

The objective of the ICR was to gather data on a national level to help assess the potential health risk of pathogens, disinfectants and disinfection by-products (DBPs). Results would ultimately guide future regulatory and public health decisions. This rule applied to all systems serving 100,000 persons or more and groundwater systems serving 50,000 persons or more. Treatment plants that used ozone or chlorine dioxide, considered alternative disinfection at the time, were required to monitor for aldehydes. Aldehydes form as a result of oxidation reactions and are therefore considered DBPs. For systems that ozonate, quarterly samples for aldehydes were collected from the ozone contactor influent, ozone contactor effluent and plant effluent. For systems that use chorine dioxide, quarterly samples were collected before chlorine dioxide application, before chlorine or chloramine application and from finished water. These samples were analyzed by the EPA Laboratory in Cincinnati for 13 aldehydes including formaldehyde using SM 6252B. These data were collected in 1997 and 1998.

ICR aldehyde data came from 20 states and included 330 formaldehyde data points. Texas, having eight water systems participating in the ICR aldehyde monitoring submitted 28 percent of all the formaldehyde data. The highest Texas formaldehyde concentration of 30.6 µg/L was analyzed in a finished water sample. An Oklahoma water system sample collected at an ozone chamber had the highest overall ICR formaldehyde concentration: 33.8 µg/L. New Jersey's highest formaldehyde concentration of 27.5 µg/L was from a sample collected at the purification unit. The corresponding finished water sample had a formaldehyde concentration of 19.2 µg/L. Based on the ICR formaldehyde results, New Jersey's data correlated with the national findings. Table 5, ICR Formaldehyde Data from New Jersey Public Water Systems, lists the three participating New Jersey water systems and their formaldehyde concentrations at various sampling locations. The samples were collected between September 1997 and December 1998. The minimum reporting level (MRL) was 5 µg/L.

Table 5
ICR Formaldehyde Data from New Jersey Public Water Systems

Community Water System	Public Water System ID #	Type of Filtration	Ozone or Chlorine Dioxide (ClO_2)	WTP* INF Result Range	WTP* Ozone Contactor Result Range	Post Sedimen-tation	WTP* Finished Water Result Range
United Water New Jersey Haworth	0238001	Direct	Ozone	5.5-8.1 µg/L	18.3-24.2 µg/L	Not Applicable	17.4 to 23.5 µg/L
NJ American Monmouth	1345001	Conventional	ClO_2	8.6 µg/L	Not Applicable	5.8-27 µg/L	6.1 to 19.2 µg/L
Brick Twp MUA	1506001	Conventional	ClO_2	5.1 µg/L	Not Applicable	5.1-9.1 µg/L	5.4 to 9.1 µg/L

*Water Treatment Plant

New Jersey Public Water System Data

More recently, two New Jersey community water systems, New Jersey American Water-Elizabeth Canal Road and New Jersey American Water- Twin Lakes Swimming River, monitored formaldehyde at their surface water treatment plants and shared their formaldehyde data with the DWQI.

New Jersey American Water Co. - Elizabeth Canal Road Water Treatment Plant

Montgomery Watson Laboratory performed the aldehyde analysis for New Jersey American Water (NJAW) Elizabeth Canal Road Water Treatment Plant (WTP) beginning in April 2002. Montgomery Watson Laboratories (which is now MWH Laboratories) analyzed aldehydes by SM 6252B. Beginning in October 2005, Environmental Health Laboratories (now Underwriters Laboratories) performed the analysis of formaldehyde for NJAW Elizabeth Canal Road WTP using EPA Method 556. SM 6252B and EPA 556 are both GC methods that require the derivatization of the aldehyde with pentafluorobenzylhydroxylamine (PFBHA). Both labs have a minimum reporting level (MRL) of 5 μg/L. The samples were taken with no specific frequency. The aldehyde data submitted to the Bureau of Safe Drinking Water ranged from April 2002 to December 2006. The samples were taken from raw water, the combined filter effluent, individual filter effluents and finished water. The highest finished water formaldehyde concentration was 35 μg/L from a sample collected in July 2006.

New Jersey American Water Co. - Twin Lakes Swimming River WTP

New Jersey American Water (NJAW) - Twin Lakes Swimming River Water Treatment Plant (WTP) sampled for aldehydes monthly from December 2004 to May 2005. Locations sampled included raw water, combined filter effluent, the pre-mix and the over filter. For the analysis, NJAW- Twin Lakes Swimming River used Environmental Health Laboratories which is now Underwriters Laboratories. The highest Twin Lakes WTP formaldehyde concentration of 130 μg/L was a sample collected after the combined filter effluent.

PQL Development for Formaldehyde

Due to the lack of formaldehyde occurrence data, development of its PQL required a different approach than that used with the VOCs. The Testing Subcommittee reviewed past and current methods used for the analysis of formaldehyde in water at levels below the HB-MCL of 100 μg/L. The MDLs and MRLs listed below in Table 6, Methods, MRLs and MDLs of Underwriters and MWH Laboratories, are those currently in use at the time of the writing of this document.

Table 6
Methods, MRLs and MDLs of Underwriters and MWH Laboratories

Laboratory:	Underwriters Laboratories	MWH Laboratories
Aldehyde Method:	EPA Method 556	SM 6252B[(c)]
Formaldehyde MRL:	5 μg/L	5 μg/L
Formaldehyde MDL:	1.18 μg/L	2.14 μg/L

(c) From Standard Methods Examination of Water and Wastewater,

Both Underwriters Laboratories and MWH Laboratories have a formaldehyde method reporting level (MRL) of 5 μg/L. Formaldehyde is used as a preservative for membranes therefore reagent water purified by reverse osmosis often contains low levels of formaldehyde. Formaldehyde in the air can be traced to insulation materials. In EPA Method 556 Revision 1.0, it is stated regarding the MRL, "Although an MDL can be calculated for analytes that commonly occur as background contaminants, the calculated MDLs should not be used as the MRL for each analyte. Method analytes that are seen in the background (typically formaldehyde, acetaldehyde) should be reported as present in field samples, only after careful evaluation of the background levels. It is recommended that a MRL be established at the mean laboratory reagent blank (LRB) concentration +3 sigma, or three times the mean LRB concentration, whichever is greater. This value should be calculated over a period of time, to reflect variability in the blank measurements. It is recommended that this value be used as a minimum reporting level in order to avoid reporting false positive results." SM 6252B suggests raising the reporting limit if formaldehyde is detected in the blank. Since detection of formaldehyde in blanks is a common problem, it was decided to base the PQL on the MRLs used by the laboratories in Table 6. Therefore, the Testing Subcommittee recommends 5 μg/L as the PQL and the use of EPA 556, EPA 556.1 or SM 6252B for the analysis of formaldehyde in drinking water.

Ethylene Glycol

After reviewing the 2a A-280 contaminant, ethylene glycol, the Health Effects Subcommittee raised the HB-MCL from 290 μg/L to 10,000 μg/L. During the last A-280 review, methods for the analysis of ethylene glycol in drinking water with detection limits near 290 μg/L were unavailable. In researching current analytical methods the Testing Subcommittee had difficulty finding a method with a detection limit lower than 10,000 μg/L. One method capable of meeting this detection limit is a modified SW-846, 8015 method. This modification requires direct injection of a "clean" aqueous sample on a GC with a flame ionization detector (FID) detector. Since the revised HB-MCL and the detection limit of the modified SW 846 8015 method coincide, the Testing Subcommittee is recommending a PQL of 10,000 μg/L for ethylene glycol.

1,2,3-Trichloropropane

1,2,3-Trichloropropane (123TCP), a 2b A280 chemical of concern in drinking water, was referred to the Testing Subcommittee by the Health Effects Subcommittee in a memo dated April 16, 2008. The Health Effects Subcommittee states in this memo that 123TCP is one of the chemicals of highest concern that the DWQI has addressed. It is both genotoxic and carcinogenic. Although a final HB-MCL has not been established, the Health Effects Subcommittee requested that the Testing Subcommittee start the research needed in the development of a PQL for 123TCP. The Health Effects Subcommittee stated that the HB-MCL would fall somewhere in the range of 1.5-9 nanograms per liter (ng/L). Since the HB-MCL is expected to be very low, the PQL is the limiting factor in determination of the MCL. A PQL is needed in order for the DWQI to develop a recommended 1,2,3-trichloropropane MCL.

A health-based drinking water guidance value of 0.005 μg/L for 1,2,3-trichloropropane was developed by the NJDEP Division of Science, Research and Technology (DSRT) in 1999. This value served as guidance for recommendations in situations where concentrations of 123TCP in drinking water at or above 0.005 μg/L were detected. An action level of 0.025 μg/L was established around the same time period which was arrived at by multiplying the DHSS Laboratory 504.1 MDL of 0.005 μg/L by five. This general approach had been used in the New Jersey Ground Water Quality Standards and in the development of New Jersey drinking water standards and further supported by peer-reviewed publications. A similar action level was determined by the Connecticut Department of Public Health. If the source of drinking water contained a verified concentration of 123TCP that exceeded the action level, the NJDEP recommended that treatment be installed and monitored for this compound every quarter by EPA Method 504.1. This recommendation was communicated in the interest of public safety as a non-enforceable recommendation.

123TCP is a by-product in the formulation of certain pesticides such as D-D and Telone. The pesticide, D-D has two active ingredients, 1,2-dichloropropane (which has an MCL of 5 μg/L) and 1,3-dichloropropene (which has been on the EPA Candidate Contaminant Lists 1 and 2). Telone consists of mainly 1,3-dichloropropene, yet 123TCP is found in both of these pesticides.

In 1999, after reviewing data from an Atlantic county case, the NJDEP Remedial Planning and Design Element of the Site Remediation Program had noted that hits of 123TCP above the action level of 0.025 μg/L were almost always accompanied by trace detections of 1,2-dichloropropane. Since 123TCP is both a pesticide and an SOC, the Bureau of Safe Drinking Water designed the SOC sampling program for the compliance period of 1999 to 2001 to include locations with past detections of 1,2-dichloropropane. In addition to the usual SOC/pesticide methods used for analysis of samples collected as part of the New Jersey SOC Waiver Program, samples from these locations were analyzed for VOCs using 524.2 of which 1,2-dichloropropane is an analyte. The results of this sampling (Table 7) confirm the correlation of 1,2-dichloropropane and 123TCP.

The concentrations of both of these contaminants, listed in Table 7**,** were detected in raw water samples collected from the public water systems listed below.

Table 7
New Jersey SOC Waiver Data Supporting the
1,2,3-Trichloropropane / 1,2-Dichloropropane Correlation

System Name	County	1,2,3-Trichloropropane (µg/L)	1,2-Dichloropropane (µg/L)
Washington Twp MUA	Gloucester	0.087	0.70
Bethel Christian	Atlantic	0.198	0.98
Blueberry Hill	Atlantic	0.263	2.00
Port Republic	Atlantic	0.226	0.81
Fairfield Adult	Cumberland	7.85	5.10

123TCP Analytical Methods

EPA method 504 was the original approved method for analysis of two regulated pesticides, ethylene dibromide (EDB) and dibromochloropropane (DBCP). EPA 504 could achieve lower MDLs than EPA 502.2. A 1995 a revision of 504 included 123TCP as a target analyte. EPA 504.1, has been used by the Bureau of Safe Drinking Water for the New Jersey SOC Waiver Program in the analysis of EDB, DBCP and 123TCP.

ECLS has been the analyzing laboratory for the New Jersey SOC Waiver Program. Their 123TCP MDLs and reporting levels are listed in Table 8 by compliance period in which they were analyzed:

Table 8
ECLS Reporting Data for 1,2,3-Trichloropropane

Compliance Period	MDL/RL (µg/L)	MDL/RL (µg/L)
1999-2001	0.004/NA*	
2002-2004	0.005/NA	0.004/0.02
2005-2007	0.007/0.02	
2008-2010	0.008/0.020	0.005/0.02

* NA =the laboratory reported anything above the MDL as a detect.

Other laboratories possessing NJ certification for 123TCP in 504.1 and their 123TCP MDLs/RLs are presented in Table 9.

Table 9
MDL/RLs of Laboratories with New Jersey Certification for Analysis of 1,2,3-Trichloropropane by EPA 504.1

Laboratory	MDL (µg/L)	RL (µg/L)
Accutest	0.019	0.020
Analytical Laboratory Services	0.004, 0.006	0.020
MWH Laboratories	0.022	0.040
Garden State Laboratory	0.011	0.025
QC Laboratories	0.0097	0.025
Cape Environmental	0.0144	0.020
ECLS	0.005	0.020

Under the federal Safe Drinking Water Regulations, the analytical methods approved for compliance sampling for VOCs are EPA 524.2 and EPA 502.2. 123TCP is a target analyte in both methods. The published method MDLs for 123TCP are listed in Table 10 and are higher than the health based guidance of 0.005 µg/L.

Table 10
Approved VOC Methods with 1,2,3-Trichloropropane as Target Analyte

Method	Published MDL (µg/L)
EPA 524.2 Rev 4.1	0.03
EPA 502.2 Rev 2.1	0.01

EPA 524.3 is an analytical method currently under development. This method will allow the use of Selected Ion Monitoring (SIM) for 123TCP resulting in a reporting level of 0.007 µg/L and a MDL of 0.003 µg/L.

Two analytical drinking water methods for 123TCP have been developed by the California Department of Health Services. In 1999 California established a notification level of 0.005 µg/L for 123TCP. A notification level is a California established health based advisory level used to provide information to public water systems and others about certain nonregulated chemicals in drinking water that lack MCLs. When chemicals are found at concentrations greater than these levels, certain requirements and recommendations apply. In order to meet this notification value of 0.005 µg/L, the CDHS developed two methods 1) *Determination of 1,2,3-Trichloropropane in Drinking Water by Purge and Trap Gas Chromatography/Mass Spectrometry* and 2) *Determination of 1,2,3 Trichloropropane in Drinking Water by Continuous Liquid-Liquid Extraction Gas Chromatography/ Mass spectrometry*. They are both GC/MS isotope dilution methods but utilize different extraction procedures. The linear calibration range for both is 5 nanograms per liter (ng/L) (0.005 µg/L) to 500 ng/L. EPA 524.2, 502.2 and 504.1 are the methods for which the NJDEP Office of Quality Assurance (OQA) currently offers

certification for the analysis of 123TCP. Of these methods, EPA 504.1 is the only method that can achieve an MDL of 0.005 µg/L.

Occurrence of 1,2,3-Trichloropropane

123TCP has been included on the EPA Candidate Contaminant List 3 however it is not one of the chemicals required for monitoring with UCMR2. Occurrence data for 123TCP was obtained from public water system VOC compliance monitoring data and the New Jersey SOC Waiver Program screening samples data stored in the SDWIS database.

123TCP is a target analyte in the VOC methods, EPA 524.2 and 502.2. The published method MDLs for 123TCP are listed in Table 10. These MDLs are an order of magnitude higher than the health-based guidance value of 0.005 µg/L.

From January 1988 to September 2008 approximately 48,000 123TCP results were obtained from VOC compliance samples analyzed using either EPA 502.2 or 524.2. The data in Table 11 is a subset of these 48,000 results where 123TCP concentrations exceeded the reporting levels. Any detections of 123TCP analyzed with the VOCs methods would be substantially higher than the health based guidance of 0.005 µg/L since the VOC methods are not as sensitive as EPA Method 504.1. Many of these detections were verified using EPA method 504.1 with the New Jersey SOC Waiver Program. Table 11 lists the county, the type of system and the concentration of 123TCP where 123TCP was detected by either of the EPA VOC methods. Table 12 is a tally of the number of systems, wells and counties having 123TCP detections as part of SOC Waiver Program sampling for each of the last three complete compliance periods.

Table 11
EPA Method 524.2 and 502.2 123TCP Detections

County	System Type*	EPA Method	Date	Concentration (µg/L)	RL (µg/L)
Ocean	CWS	502.2	5/22/89	1	0.5
Atlantic	NTNC	502.2	12/9/91-6/3/93	0.14-0.79	0.5
Bergen	CWS	502.2	9/24/91	148	0.5
Monmouth	NPWS	524.2	7/28/92	3.55	0.4
Camden	CWS	502.2	8/6/93	3.1	0.5
Hunterdon	NTNC	502.2	11/29/93	0.1	0.08
Hunterdon	NPWS	502.2	11/29/93	0.1	0.08
Essex	CWS	502.2	6/23/94	1	0.34
Morris	CWS	502.2	12/12/95	1	0.23
Burlington	CWS	502.2	1/7/97	0.8	0.75
Burlington	CWS	524.2	6/6/97	0.6	0.5
Burlington	NTNC	502.2	10/29/97, 8/10/98	1.0, 3.6	0.17
Burlington	CWS	502.2	11/24/97	0.28	0.1
Atlantic	NPWS	502.2	2/18/99	0.77	0.12
Hunterdon	NTNC	524.2	3/9/00	1.3	0.5
Hunterdon	CWS	502.2	12/31/01	0.4	0.34
Mercer	NTNC	524.2	6/24/04	0.51	0.25
Atlantic	CWS	524.2	1/3/06	0.81	0.15

*CWS = community water system; NTNC = nontransient noncommunity water system; NPWS = nonpublic water system

Table 12
New Jersey SOC Waiver Program Data
by Concentration Level and Compliance Period

Compliance Period	1999-2001	2002-2004	2005-2007
ECLS RL (μg/l)	0.004	0.02	0.02
Wells sampled	211	145	192
Systems sampled	150	120	160
Wells with detects	8	6	3
Systems with detects	8	6	2
Wells with detects over 0.025 μg/L	7	5	2
Systems with detects over 0.025 μg/L	7	5	1
Counties with detects	Atlantic, Cumberland, Gloucester, Salem	Atlantic, Cumberland, Gloucester, Salem, Union	Camden, Union
Counties with detects over 0.025 μg/L	Atlantic, Cumberland, Gloucester, Salem	Cumberland, Gloucester, Salem	Camden

Between the occurrence data from Safe Drinking Water VOC analyses and NJ SOC Waiver Program, the following New Jersey counties have had detections of 123TCP: Atlantic, Bergen, Burlington, Camden, Cumberland, Essex, Gloucester, Hunterdon, Mercer, Monmouth, Morris, Salem and Union. Of the 16 systems that had detections of 123TCP, 13 were over the action level of 0.025 μg/L. When developing regulatory monitoring requirements for 123TCP it should be noted that, unlike the other two 504.1 analytes, EDB and DBCP which have county wide waivers, detections of 123TCP are not localized to one part of the state.

PQL Determination:

Occurrence of 123TCP in New Jersey drinking water has been established. From the Safe Drinking Water Program data, of which the New Jersey SOC Waiver Program is a part, 123TCP has been found in Atlantic, Bergen, Burlington Camden, Cumberland, Essex, Gloucester, Hunterdon, Mercer, Monmouth, Morris, Salem and Union counties. 123TCP is therefore found throughout the state.

With the exception of the California laboratory, MWH Laboratories, (which run their own state methods for meeting lower reporting levels), the information from Table 9, shows a median reporting level of 0.020 μg/L. Because of concerns regarding the toxicity of 123TCP, the BSDW requested the ECLS Laboratory (the analyzing lab for the New

Jersey SOC Waiver program) meet certain criteria regarding 123TCP. The BSDW required a MDL of 0.005 μ/L or lower and a reporting level of 0.025 μg/L or lower. Using the ECLS Laboratory MDL of 0.005 μg/L with the factor of 5, the PQL for 123TCP becomes 0.03 μg/L (once rounded to one significant figure.) Therefore, the Testing Subcommittee is recommending a PQL of 0.03 μg/L for 123TCP.

DCPA (Dimethyl tetrachloroterphthalate) and Degradates

Dacthal, a trade name for DCPA (dimethyl tetrachloroterphthalate), was referred to the Testing Subcommittee in a memo dated April 10, 2008 recommending a HB-MCL of 28 μg/L. The HB-MCL of 28 μg/L was developed for the combined concentration of DCPA and its environmental degradates. These degradates are the mono-acid, MTP (monomethyl tetrachloroterephthalic acid) and the di-acid, TPA (tetrachloroterephthalic acid). Although data is limited for these degradates, they appear to have low toxicity and therefore this HB-MCL of 28μg/L is expected to be protective of the degradates as well.

In water, DCPA degrades to the mono-acid, and the di-acid. The half life of the mono acid is short compared to that of the di-acid making the TPA the more prominent of the two degradates.

Information on DCPA and/or degradates was accessible from two sources:1) EPA Unregulated Compound Monitoring Rule (UCMR) and 2) the New Jersey Synthetic Organic Compound Waiver Program.

UCMR

Under the EPA **Unregulated Contaminant Monitoring Regulation (**UCMR), monitoring for DCPA degradates (combined) was conducted by all large public community water systems and a statistical, nationally representative sample of small public water systems. Monitoring for DCPA was not required. The UCMR chose the contaminants for the rule primarily from the Candidate Contaminant List 1 (CCL1). The DCPA mono and di acid degradates, but not DCPA itself, were on the CCL1. To be a Candidate Contaminant, the contaminant had to meet certain criteria regarding occurrence and health concerns. As part of national USGS and EPA pesticide use studies, DCPA had been determined to be in use in all ten EPA regions and therefore served as the proxy for evidence of DCPA degradate occurrence. The EPA Health Advisory for DCPA of 70 μg/L was said to be protective of the degradates, thereby satisfying the CCL health concern requirement.

Under the UCMR1, the analysis for DCPA degradates was run using EPA Methods 515.1, 515.2, 515.3 and 515.4. The analytical methods 515.1, 515.2 and 515.4 do not distinguish between the two degradates and results were reported as combined DCPA degradates. Method 515.3 gives the total concentration of DCPA plus the two degradates. Method 508 is the only method that quantitates the parent compound DCPA separately. It does not include the degradates as target analytes. EPA methods 508, 515.1, 515.2, 515.3

and 515.4 all involve hydrolyzation, extraction , derivatization and a cleanup step before detection by GC/ECD.

The UCMR allowed the use of EPA 515.3 however it required retesting by 515.1 or 515.2 if the result was over the reporting limit of 1 μg/L. Procedurally the same as method 515.3 except for an additional wash step following hydrolysis, 515.4 was developed to eliminate the need for labs to reanalyze samples having hits of the degradates. The MDLs for these methods are listed in Table 13 below:

Table 13
Analytical Methods used for DCPA and/or DCPA Degradates

Methods	Analyte	RL (μg/L)	MDL (μg/L)	Allowed for UCMR
EPA 508	**DCPA**		**0.025**	**No**
EPA 515.1	**Combined DCPA degradates**	**1**	**0.067**	**Yes**
EPA 515.2	**Combined DCPA degradates**	**1**	**0.13**	**Yes**
EPA 515.3	**Combined DCPA and degradates**	**1**	**0.63**	**Yes (if ND)**
EPA 515.4	**Combined DCPA degradates**	**1**	**0.113**	**Yes**

The States where between 15 and 42 percent of their total public water systems had DCPA degradate detections were Arizona, Delaware, Nebraska, New Jersey, Rhode Island and Guam. The maximum concentration detected was 39 μg/L for the large systems and 190 μg/L for small systems. The large system detection of 39 μg/L was from the New Jersey water system, Elizabethtown Water Company (Hummocks Station Plant) in Union County. Tallied UCMR data for New Jersey is listed in Table 14:

Table 14
New Jersey Results from the EPA UCMR

DCPA Degradates	Number of Analyses	Number of PWS Sampled	Number of Detects	Number of PWS with Detects	Minimum Detection (μg/L)	Maximum Detection (μg/L)	Mean Detection Value (μg/L)	RL (μg/L)
	993	**123**	**127**	**30**	**1**	**39**	**3.4**	**1**

New Jersey counties which had detects of DCPA degradates with the UCMR1 monitoring were: Atlantic, Bergen, Burlington, Camden, Cumberland, Essex, Mercer, Middlesex, Monmouth, Morris, Passaic, and Union. Bergen county had the most samples with detects and Union county had the highest percentage of water systems with detects. The highest concentration of DCPA degradates was found in Union county.

NJ SOC Waiver Program:

For the 1999-2001 NJ SOC Waiver Compliance Period, DCPA was included as an SOC of special interest. DCPA was not one of the unregulated SOCs required by the EPA for monitoring at that time. However, since USGS and EPA national pesticide surveys and studies reported that DCPA was applied in New Jersey in large quantities, the NJDEP Division of Science Research and Technology recommended that the Bureau of Safe Drinking Water include DCPA as an emerging contaminant of concern in the SOC screening program.

The ECLS Laboratory as been used by the BSDW for the analysis of all SOC Waiver Program screening samples. Prior to the 1999-2001 compliance period, the ECLS analyzed the regulated pesticides, EDB and DBCP with EPA 515.2. This method also quantitates the combined DCPA degradates. Because BSDW was interested in determining occurrence data for the parent compound in addition to the degradates, ECLS was asked to obtain certification for method 515.3. EPA 515.3 was a recently developed method able to quantitate the parent compound together with the two degradates. After evaluating the method, the New Jersey Department of Health and Senior Services Laboratory (which is now ECLS) obtained certification for 515.3 and has since used this method for the SOC program. The method used and the MDLs and reporting levels used by the ECLS for the New Jersey SOC Waiver Program screening samples are listed in the Table 15 below:

Table 15

ECLS Reporting Limits for DCPA & degradates with the NJ SOC Waiver Program

Compliance Period	Method	Analytes	RL (µg/L)	MDL (µg/L)
1999-2001	**EPA 515.3**	**Combined DCPA and degradates**	**(used MDL)**	**0.22**
2002-2004	**EPA 515.3**	**Combined DCPA and degradates**	**0.625**	**0.318**
2005-2007	**EPA 515.3**	**Combined DCPA and degradates**	**0.625**	**0.09**

The NJDEP DSRT developed a health-based guidance value for DCPA of 70 µg/L due to a significant number of detections of DCPA and degradates during the first compliance period during which it was monitored as part of the NJ SOC Waiver Program. Since 28 µg/L is the recommended HB-MCL, the past detections of DCPA and degradates from the SOC Waiver Program data are broken down according to those: 1) over the HB-MCL, 2) between half the HB-MCL(14µg/L) and 28 µg/L and 3) between 1 µg/L and half the HB-MCL(14µg/L). Table 16 categorizes the detections by number of water systems and Table 17 categorizes the detections by number of samples taken.

Table 16
DCPA and Degradates Detections by Number of Water Systems

Compliance Period	# Systems Analyzed	# Systems > 28 µg/L	# Systems 14-28 µg/L	# Systems 1-14 µg/L
1999-2001	233	3	2	19
2002-2004	147	1	1	3
2005-2007	66	1	2	7

Table 17
DCPA and Degradates Detections by Number of Samples Taken

Compliance Period	# of samples Analyzed	# of samples >28 µg/L	# of samples 14-28 µg/L	# of samples 1-14 µg/L
1999-2001	362	3	2	19
2002-2004	230	1	1	4
2005-2007	90	1	2	8

Dacthal and/or its degradates were found at levels greater than 1 µg/L in Atlantic, Bergen Burlington, Cumberland, Essex, Gloucester, Hunterdon, Mercer, Middlesex, Morris, Ocean, Union, and Warren counties. To date, the highest concentration of DCPA and degradates detected through the SOC Waiver Program was found at a golf course in Hunterdon county. This golf course, which was sampled in the 2005-2007 compliance period, had a DCPA and degradates concentration of 166 µg/L.

PQL for DCPA and degradates

DCPA (Dacthal) and/or its degradates were found at levels greater than 1 µg/L in Atlantic, Bergen, Burlington, Camden, Cumberland, Essex, Gloucester, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Union, and Warren counties. Its presence is not localized to one section of the state.

The Testing Subcommittee reviewed the information from the UCMR1 and the NJ SOC Waiver Program and is recommending a PQL of 1 µg/L for DCPA and degradates. This PQL was based on the UCMR reporting limit of 1 µg/L for DCPA degradates in view of the fact that the rigors of evaluation had already been undertaken by the EPA to arrive at this minimum reporting level. Since the HB-MCL for dacthal (DCPA) and degradates is 28 µg/L, the proposed PQL will not be a limiting factor in establishing an MCL.

The method used by New Jersey for DCPA and degradates will remain as EPA 515.3 since this is the only method that includes the parent compound in the combined

quantitative result. A possible option for laboratories would allow the use of the degradate only methods, and require re-analysis of the sample by EPA 515.3 for detections over the PQL of 1 μg/L.

Testing Subcommittee Recommendations

The Testing Subcommittee completed a review of the A280 compounds referred by the Health Effects Subcommittee. The Health Effects Subcommittee referred thirty-one A280 contaminants, ten of which did not require a review (of these, two PQL's reviews were conducted at the discretion of the Testing Subcommittee which resulted in the lowering of the PQLs for methylene chloride and 1,1,1-trichloroethane). The recommended PQLs for twenty-two contaminants are listed in Table 18, **Testing Subcommittee A280 PQL Review Results**. (Review of 2,4,6-trichlorophenol had not been performed by the time of the writing of this document.)

In summary the Testing Subcommittee is recommending to:

1) Lower the PQLs of 12 volatile organic compounds (including lowering the PQL from 2 μg/L to 1 μg/L for Methylene Chloride, lowering the PQL from 1 μg/L to 0.9 μg/L for 1,1,1-Trichloroethane, and lowering the PQL from 20 μg/L to 2 μg/L for Methyl Ethyl Ketone using EPA Method 524.2);

2) Retain the same PQL for 3 volatile organic compounds, Tetrachloroethene, 1,1,2,2-Tetrachloroethane, and 1,1- Dichloroethane;

3) Retain 0.5 μg/L as the PQL for Chlordane;

4) Retain 0.5 μg/L as the PQL for PCBs;

5) Collect additional occurrence data on PCBs. (This will be done by the NJDEP);

6) Lower the PQL from 5 μg/L to 3 μg/L for n-Hexane using EPA Method 524.2;

7) Lower the PQL from 41 μg/L to 5 μg/L for formaldehyde using EPA Method 556, EPA Method 556.1 or SM 6252B;

8) Establish a PQL of 10,000 μg/L for Ethylene Glycol;

9) Establish a PQL of 1 μg/L for DCPA and degradates;

10) Establish a PQL of 0.03 μg/L for 1,2,3-Trichloropropane.

Table 18
Testing Subcommittee A280 PQL Review Results

Chemical	Type	Health-Based MCL (ug/L)	Health-Based Δ (ug/L)	Current PQL (ug/L)	PQL Δ Y/N	Proposed PQL (µg/L)	DWQI MCL (µg/L)	EPA MCL (µg/L)
Benzene	2a	0.15	0.1↓	1	Y	0.8	1	5
Carbon Tetrachloride	2a	0.39	N	2	Y	0.9	2	5
1,2-Dichloroethane	2a	0.29	N	2	Y	1	2	5
Tetrachloroethene	2a	0.44	N	1	N	1	1	5
Vinyl Chloride	2a	0.084	0.023↓	5	Y	1	2	2
1,1,2,2-Tetrachloroethane	2b	1	0.2↓	1	N	1	1	None
1,1,2-Trichloroethane	2b	3	0.6↓	2	Y	1	3	5
1,3-Dichlorobenzene	2a	600	6↓	5	Y	1	600	None
1,4-Dichlorobenzene	2a	150	14↓	5	Y	1	75	75
1,1-Dichloroethane	2b	46	23↓	1	N	1	50	None
1,1-Dichloroethene	2a	1	7↑	2	Y	0.9	2	7
1,2,4-Trichlorobenzene	2a	8.6	18↑	5	Y	1	9	70
Methylene Chloride	2a	2.5	N	2	Y	1	3	5
Methyl Ethyl Ketone	2a	270	4000↑	20	Y	2	None	None
1,1,1-Trichloroethane	2a	26	1960↑	1	Y	0.9	30	200
Chlordane	2a	0.013	N	0.5	N	0.5	0.5	2
PCBs	2a	0.020	N	0.5	N	0.5	0.5	0.5
n-Hexane	2a	33	N	5	Y	3	None	None
Formaldehyde	2a	100	N	41	Y	5	None	None
Ethylene Glycol	2a	290	10000↑	None		10000	None	None
DCPA and degradates	2b		28	None		1	None	None
1,2,3-Trichloropropane	2b	None	0.0013	None		0.03	None	None

Key:
Δ = Change
↑ = An increase
↓ = A decrease

Appendix A

2005
EPA Method 524.2
Benzene

SDW Program MDLs (µg/L)

Laboratory	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	0.09			
Aqua ProTech	0.23			
JR Henderson	0.22	0.17	0.26	
Water Works	0.12			
AqPA	0.18			
American Water Service Laboratory	0.09			

PWTA Program MDLs (µg/L)

Laboratory	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.20	0.30		
Analytical Lab Services	0.16	0.15		
Aqua Pro Tech	0.23			
Cape Environ.	0.09			
Garden State	0.09			
Vineland	0.22			
QC	0.30			
South Jersey Water Testing	0.11	0.10		
Precision Analytical	0.15			

Combined MDLs:0.30RAD, 0.30QC, 0.26, 0.23APT, 0.22JRH, 0.22VL, 0.20, 0.18, 0.17, 0.16, 0.15ALS, 0.15Prec, 0.12, 0.11, 0.1NJAL, 0.1SJWT, 0.09GS, 0.09Cape, 0.09Am,

For 19 MDLs, Median is 0.16 µg/L

2006
EPA Method 524.2
Benzene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.42	0.50	0.30	
Garden State	0.09			
Aqua Pro Tech	0.23	0.15		
JR Henderson	0.17	0.22		
Water Works	0.12	0.08		
AqPA	0.22			
American Water Laboratory Services	0.10			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.30	0.20		
Analytical Lab Services	0.11	0.09	0.12	
Aqua ProTech	0.23	0.15		
Cape Environ.	0.09			
Garden State	0.09			
Vineland	0.22			
QC	0.30	0.50	0.42	
South Jersey Water Testing	0.10	0.37		
Precision Analytical	0.15			

Combined MDLs: 0.50QC, 0.42QC , 0.37, 0.30RAD, 0.30QC, 0.23APT, 0.22AqPA, 0.22VL, 0.22JRH, 0.20, 0.17, 0.15APT, 0.15Prec, 0.12WW, 0.12ALS, 0.11, 0.10NJAL, 0.10Am, 0.10SJWT, 0.09ALS, 0.09GS, 0.09Cape, 0.08

For 23 MDLs, Median is 0.15 µg/L

2007
EPA Method 524.2
Benzene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.15	0.26	0.42	
Garden State	0.06			
Aqua Pro Tech	0.15	0.17		
JR Henderson	0.17	0.36	0.22	
Water Works	0.08	0.10		
AqPA	0.22			
American Water Laboratory Services	0.13			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Laboratory	0.10			
RaData	0.30			
Analytical Lab Services	0.11	0.09	0.12	
Aqua ProTech	0.15	0.17		
Cape Environ.	0.08	0.46		
Garden State	0.06			
Vineland	0.22			
QC	0.42	0.15	0.26	
South Jersey Water Testing	0.50			
Precision Analytical	0.15	0.06	0.11	

Combined MDLs: 0.50, 0.46, 0.42QC, 0.36, 0.30RAD, 0.26QC, 0.22JRH, 0.22AqPA, 0.22VL, 0.17APT, 0.17JRH, 0.15QC, 0.15Prec, 0.15APT, 0.13, 0.12, 0.11ALS, 0.11Prec, 0.10WW, 0.10NJAL, 0.09, 0.08WW, 0.08Cape, 0.06Prec, 0.06GS

For 25 MDLs, Median is 0.15 ug/L

Benzene Median MDLs (µg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	**0.16 (19)**	**0.15 (23)**	**0.15 (25)**	**0.15**

( ) = Number of MDLs considered for median

2005
EPA Method 524.2
Carbon Tetrachloride

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	0.10			
Aqua Pro Tech	0.29			
JR Henderson	0.28	0.36	0.16	
Water Works	0.17			
AqPA	0.12			
American Water Lab Services	0.12			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.30			
Analytical LabServices	0.19	0.08		
Aqua ProTech	0.29			
Cape Environ.	0.12			
Garden State	0.10			
Vineland	0.35			
QC	0.30			
South Jersey Water Testing	0.11			
Precision Analytical	0.16			

Combined MDLS: 0.36, 0.35, 0.30RAD, 0.30QC, 0.29APT, 0.28, 0.19, 0.17, 0.16Prec, 0.16JRH, 0.12Am, 0.12AqPA, 0.12Cape, 0.11, 0.10GS, 0.10NJAL, 0.08

For 17 MDLs, Median is 0.16 µg/L

2006
EPA Method 524.2
Carbon Tetrachloride

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30	0.26		
Garden State	0.10			
Aqua Pro Tech	0.29	0.15		
JR Henderson	0.36	0.16		
Water Works	0.17	0.14		
AqPA	0.27			
American Water Lab Services	0.15			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.30			
Analytical Lab Services	0.18	0.08		
Aqua Pro Tech	0.29	0.15		
Cape Environ.	0.12			
Garden State	0.10			
Vineland	0.35			
QC	0.30	0.26		
South Jersey Water Testing	0.11	0.30		
Precision Analytical	0.16			

Combined MDLs: 0.36, 0.35, 0.31, 0.30RAD, 0.30SJWT, 0.30QC, 0.29APT, 0.27, 0.26QC, 0.18ALS, 0.17, 0.16Prec, 0.16JRH, 0.15Am, 0.15APT, 0.14WW, 0.12, 0.11, 0.10GS, 0.10NJAL, 0.08

For 21 MDLs, Median is 0.17 ug/L

2007
EPA Method 524.2
Carbon Tetrachloride

SDW Program MDLs (μg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.17	0.26	0.28	
Garden State	0.03			
Aqua ProTech	0.14	0.15		
JR Henderson	0.36	0.16	0.43	
Water Works	0.16	0.14		
AqPA	0.27			
American Water Lab Services	0.15			

PWTA Program MDLs (μg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.30			
Analytical Lab Services	0.18	0.08		
Aqua Pro Tech	0.14	0.15		
Cape Environ.	0.44	0.41		
Garden State	0.03			
Vineland	0.35			
QC	0.28	0.26	0.17	
South Jersey Water Test	0.30			
Precision Analytical	0.16	0.49	0.12	

Combined MDLS: 0.49, 0.44, 0.43, 0.41, 0.36, 0.35, 0.30RAD, 0.30SJWT, 0.28QC, 0.27, 0.26QC, 0.18, 0.17QC, 0.16Prec, 0.16JRH, 0.16WW, 0.15Am, 0.15APT, 0.14WW, 0.14APT, 0.12, 0.10NJAL, 0.08, 0.03GS

For 24 MDLs,Median is (0.17 + 0.18)/2 = 0.18 ug/L

Carbon Tetrachloride Median MDLs (μg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	**0.16 (17)**	**0.17 (21)**	**0.18 (24)**	**0.17**

( ) = Number of MDLs considered for median

2005
EPA Method 524.2
1,2-Dichloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	0.15			
Aqua Pro Tech	0.30			
JR Henderson	0.28	0.22	0.23	
Water Works	0.12	0.21	0.20	
AqPA	0.18			
American Water Lab Services	0.08			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.20	0.30		
Analytical Lab Services	0.13	0.24		
Aqua ProTech	0.30			
Cape Environ.	0.09			
Garden State	0.15			
Vineland	0.22			
QC	0.30			
South Jersey Water Test	0.11	0.10	0.41	
Precision Analytical	0.15			

Combined MDLS: 0.41, 0.30RAD, 0.30APT, 0.30QC, 0.28, 0.24, 0.23JRH, 0.22VL, 0.22JRH, 0.21WW, 0.20RAD, 0.20WW, 0.18, 0.15GS, 0.15Prec, 0.13ALS, 0.12, 0.11, 0.10NJAL, 0.10SJWT, 0.09, 0.08

For 22 MDLs, Median is (0.20+ 0.20)/2 = 0.20 µg/L

2006
EPA Method 524.2
1,2-Dichloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30	0.40	0.31	
Garden State	0.14			
Aqua Pro Tech	0.10	0.30		
JR Henderson	0.22	0.23		
Water Works	0.12	0.21	0.20	
AqPA	0.10			
American Water Services Lab	0.10			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.20	0.30		
Analytical LabServices	0.24	0.12	0.17	
Aqua ProTech	0.30	0.10		
Cape Environ.	0.09			
Garden State	0.14			
Vineland	0.22			
QC	0.30	0.40	0.31	
South Jersey Water Test	0.10	0.41		
Precision Analytical	0.15			

Combined MDLS:0.41, 0.40QC, 0.31QC, 0.30QC, 0.30RAD, 0.30APT, 0.24, 0.23, 0.22JRH, 0.22VL, 0.21, 0.20WW, 0.20RAD, 0.17, 0.15Prec, 0.14GS, 0.12ALS, 0.12WW, 0.10AmW, 0.10AqPA, 0.10SJWT, 0.10NJAL, 0.10APT, 0.09

For 24 MDLs, Median is (0.20 + 0.20)/2 = 0.20 ug/L

2007
EPA Method 524.2
1,2-Dichloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.31	0.08	0.29	
Garden State	0.07			
Aqua ProTech	0.10	0.11		
JR Henderson	0.22	0.23	0.34	0.20
Water Works	0.12	0.20		
Aqua PA	0.10			
American Water Lab Services	0.18			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.30			
Analytical Lab Servics	0.12	0.24	0.17	
Aqua ProTech	0.11	0.10		
Cape Environmental	0.05	0.47		
Garden State	0.07			
Vineland	0.22			
QC	0.31	0.08	0.29	
South Jersey Water Testing	0.41			
Precision Analytical	0.15	0.06	0.11	

Combined MDLs*:* 0.47, 0.41, 0.34, 0.31QC, 0.30, 0.29QC, 0.24, 0.23, 0.22JRH, 0.22VL, 0.20JRH, 0.20WW, 0.18, 0.17, 0.15Prec, 0.12WW, 0.12ALS, 0.11APT, 0.11Prec, 0.10NJAL, 0.10AqPA, 0.10APT, 0.08QC, 0.07GS, 0.06Prec, 0.05

For 26 MDLs, Median is (0.17 + 0.18)/2 = 0.18 µg/L

1,2-Dichloroethane Median MDLs (µg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	**0.20 (22)**	**0.20 (24)**	**0.18 (26)**	**0.19**

( ) = Number of MDLs considered for median

2005
EPA Method 524.2
Tetrachloroethene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.50	0.30		
Garden State	0.15			
Aqua ProTech	0.26			
JR Henderson	0.28	0.32	0.16	
Water Works	0.30			
AqPA	0.12			
American Water Lab Services	0.14			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.04			
Analytical Lab Services	0.17	0.20		
Aqua Pro Tech	0.26			
Cape Environ.	0.12			
Garden State	0.15			
Vineland	0.20			
QC	0.50	0.30		
South Jersey Water Test	0.12			
Precision Analytical	0.12			

Combined MDLs:0.50QC, 0.40,0.32, 0.30QC, 0.30WW, 0.28, 0.26APT, 0.20VL, 0.20ALS, 0.17, 0.16, 0.15GS, 0.14, 0.12AqPA, 0.12Cape, 0.12SJWT, 0.12Prec, 0.10, 0.04

For 18 MDLs, Median is (0.16 + 0.17)/2 = 0.17 µg/L

2006
EPA Method 524.2
Tetrachloroethene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.29	0.30		
Garden State	0.07			
Aqua Pro Tech	0.26	0.16		
JR Henderson	0.16	0.32		
Water Works	0.30	0.27		
AqPA	0.25			
American Water Lab Services	0.08			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJAL	0.10			
RaData	0.40			
Analytical Lab Services	0.19	0.21		
Aqua Pro Tech	0.26	0.16		
Cape Environ.	0.12			
Garden State	0.07			
Vineland	0.20			
QC	0.29	0.30		
South Jersey Water Test	0.32			
Precision Analytical	0.12			

Combined MDLs:0.40, 0.32SJWT, 0.32JRH, 0.30QC, 0.30WW, 0.29QC, 0.27, 0.26, 0.25, 0.21, 0.20RAD, 0.20VL, 0.19APT, 0.16APT, 0.16JRH, 0.12Cape, 0.12Prec, 0.10, 0.08, 0.07GS

For 19 MDLs, Median is 0.21 µg/L

2007
EPA Method 524.2
Tetrachloroethene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.25	0.16	0.29	
Garden State	0.06			
Aqua ProTech	0.17	0.16		
JR Henderson	0.16	0.32	0.39	
Water Works	0.23	0.27		
AqPA	0.25			
American Water Services Lab	0.15			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Labs	0.10			
RaData	0.40			
Analytical Lab Services	0.19	0.21		
Aqua ProTech	0.17	0.16		
Cape Environ.	0.06	0.43		
Garden State	0.06			
Vineland	0.20			
QC	0.29	0.16	0.25	
South Jersey Water Test	0.32			
Precision Analytical	0.12	0.11		

Combined MDLs: 0.43, 0.40, 0.39, 0.32SJWT, 0.32JRH, 0.29QC, 0.27, 0.25QC, 0.25AqPA, 0.23, 0.21, 0.20VL, 0.19, 0.17APT, 0.16QC, 0.16APT, 0.16JRH, 0.15, 0.12, 0.11, 010, 0.06GS, 0.06Cape

For 23 MDLs, Median is 0.20 µg/L

Tetrachloroethene Median MDLs (µg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	**0.17 (18)**	**0.21 (19)**	**0.20 (23)**	**0.19**

( ) = Number of MDLs considered for median

2005
EPA Method 524.2
Vinyl Chloride

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	0.12			
Aqua ProTech	0.41			
JR Henderson	0.11	0.36	0.18	
Water Works	0.12	0.40		
AqPA	0.19			
American Water Lab Services	0.07			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.40			
Analytical LabServices	0.23	0.18		
Aqua ProTech	0.41			
Cape Environ.	0.19			
Garden State	0.12			
Vineland	0.25			
QC	0.30			
South Jersey Water Testing	0.17	0.25		
Precision Analytical	0.20			

Combined MDLs:0.41APT, 0.40RAD, 0.40WW, 0.36, 0.30QC, 0.25SJWT, 0.25VL, 0.23, 0.20, 0.19Cape, 0.19AqPA, 0.18JRH, 0.18ALS, 0.17, 0.12GS, 0.12WW, 0.11, 0.10, 0.07

For 19 MDLs, Median is 0.19 µg/L

2006
EPA Method 524.2
Vinyl Chloride

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	0.10			
Aqua Pro Tech	0.41	0.19		
JR Henderson	0.11	0.18		
Water Works	0.12	0.40		
AqPA	0.14			
American Water Lab Services	0.18			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.40			
Analytical LabServices	0.26	0.18		
Aqua Pro Tech	0.19	0.41		
Cape Environ.	0.19			
Garden State	0.10			
Vineland	0.25			
QC	0.30			
South Jersey Water Test	0.17	0.30		
Precision Analytical	0.20			

Combined MDLS:0.41APT, 0.40RAD, 0.40WW, 0.30QC, 0.30SJWT, 0.26, 0.25, 0.20, 0.19Cape, 0.19APT, 0.18JRH, 0.18ALS, 0.18Am, 0.17, 0.14, 0.12W, 0.11, 0.10GS, 0.10NJAL

For 19 MDLs, Median is 0.19 µg/L

2007
EPA Method 524.2
Vinyl Chloride

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30	0.32	0.21	
Garden State	0.08			
Aqua Pro Tech	0.23	0.19		
JR Henderson	0.11	0.18	0.29	
Water Works	0.12	0.29		
AqPA	0.29			
American Water Lab Services	0.09			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.40			
Analytical Lab Services	0.26	0.18		
APT	0.19	0.23		
Cape Environ.	0.08	0.47		
Garden State	0.08			
Vineland	0.25			
QC	0.21	0.32	0.30	
South Jersey Water Testing	0.30			
Precision Analytical	0.20	0.22	0.13	

Combined MDLS:0.47, 0.40, 0.32QC, 0.30QC, 0.30SJWT, 0.29WW, 0.29JRH, 0.29AqPA, 0.26, 0.25, 0.23APT, 0.22, 0.21QC, 0.20, 0.19APT, 0.18ALS, 0.18JRH, 0.13, 0.12, 0.11, 0.10, 0.09, 0.08GS, 0.08Cape

For 24 MDLs, Median is (0.22+0.21)/2 = 0.22 µg/L

Vinyl ChlorideMedian MDLs (µg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	**0.19 (19)**	**0.19 (19)**	**0.22 (24)**	**0.20**

( ) = Number of MDLs considered for median

2005
EPA Method 524.2
1,1,2,2-Tetrachloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	0.17			
Aqua ProTech	0.46			
JR Henderson	0.20	0.30	0.33	
Water Works	0.32			
Aqua PA	0.34			
American Water Lab Services	0.13			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJAL	0.30			
RaData	0.30	0.20		
Analytical Lab Services	0.14	0.16		
Aqua Pro Tech	0.46			
Cape Environ.	0.21			
Garden State	0.17			
Vineland	0.24			
QC	0.30			
South Jersey Water Test	0.07	0.10	0.29	
Precision Analytical	0.10			

Combined MDLS:
0.46APT, 0.34, 0.33, 0.32, 0.30QC, 0.30RAD, 0.30NJAL, 0.30JRH, 0.29, 0.24, 0.21, 0.20JRH, 0.20RAD, 0.17GS, 0.16, 0.14, 0.13, 0.10SJWT, 0.10Prec, 0.07

For 20 MDLs, Median is (0.24 + 0.21)/2 = 0.23 µg/L

2006
EPA Method 524.2
1,1,2,2-Tetrachloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.40	0.30	0.37	
Garden State	0.11			
Aqua ProTech	0.46	0.25		
JR Henderson	0.20	0.33		
Water Works	0.17	0.32		
Aqua PA	0.28			
American Water Lab Services	0.06			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJAL	0.30			
RaData	0.30	0.20		
Analytical Lab Services	0.05	0.13		
Aqua Pro Tech	0.46	0.25		
Cape Environ.	0.21			
Garden State	0.11			
Vineland	0.23			
QC	0.37	0.40	0.30	
South Jersey Water Test	0.10	0.29		
Precision Analytical	0.10			

Combined MDLS: 0.46,0.40QC, 0.37QC, 0.33, 0.32, 0.30QC, 0.30RAD, 0.30NJAL, 0.29, 0.28, 0.25APT, 0.23, 0.21, 0.20JRH, 0.20RAD, 0.17, 0.13, 0.11GS, 0.10SJWT, 0.10Prec, 0.06, 0.05

For 22 MDLs, Median is (0.25 + 0.23)/2 = 0.24 µg/L

2007
EPA Method 524.2
1,1,2,2-Tetrachloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.14	0.27	0.37	
Garden State	0.06			
Aqua ProTech	0.25	0.17		
JR Henderson	0.20	0.33	0.21	
Water Works	0.17			
Aqua PA	0.28			
American Water Lab Services	0.19			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJAL	0.30			
RaData	0.30			
Analytical Lab Services	0.05	0.13		
Aqua ProTech	0.25	0.17		
Cape Environ.	0.05	0.36		
Garden State	0.06			
Vineland	0.23			
QC	0.37	0.27	0.14	
South Jersey Water Test	0.29			
Precision Analytical	0.10	0.29		

Combined MDLS: 0.37GS, 0.36. 0.33, 0.30NJAL, 0.30RAD, 0.29Prec, 0.28, 0.27QC, 0.25APT, 0.23, 0.21, 0.20, 0.19, 0.17WW, 0.17APT, 0.14QC, 0.13, 0.10, 0.06GS, 0.05Cape, 0.05ALS

For 22 MDLs, Median is (0.23 + 0.21) /2 = 0.22 µg/L

1,1,2,2-Tetrachloroethane Median MDLs (µg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	**0.23 (20)**	**0.24 (22)**	**0.22 (22)**	**0.23**

( ) = Number of MDLs considered for median

2005
EPA Method 524.2
1,1,2-Trichloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	0.16	M		
Aqua ProTech	0.25			
JR Henderson	0.25	0.24	0.26	
Water Works	0.38			
Aqua PA	0.43			
American Water Lab Services	0.13			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.50			
RaData	0.20	0.30		
Analytical Lab Services	0.12			
Aqua Pro Tech	0.25			
Cape Environ.	0.18			
Garden State	0.16			
Vineland	0.30			
QC	0.30			
South Jersey Water Test	0.10	0.08	0.28	
Precision Analytical	0.11			

Combined MDLS: 0.50, 0.43, 0.38, 0.30RAD, 0.30VL, 0.30QC, 0.28, 0.26, 0.25APT, 0.25JRH, 0.24, 0.20, 0.18, 0.16GS, 0.13, 0.12, 0.11, 0.10, 0.08

For 19 MDLs, Median is 0.25 µg/L

2006
EPA Method 524.2
1,1,2-Trichloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.40	0.32	0.30	
Garden State	0.13			
Aqua ProTech	0.25	0.17		
JR Henderson	0.26	0.25	0.24	
Water Works	0.38	0.18		
Aqua PA	0.15			
American Water Lab Services	0.13			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.50			
RaData	0.20	0.30		
Analytical Lab Services	0.16			
Aqua Pro Tech	0.25	0.17		
Cape Environ.	0.18			
Garden State	0.13			
Vineland	0.30			
QC	0.30	0.40	0.32	
South Jersey Water Test	0.10	0.28		
Precision Analytical	0.11			

Combined MDLS: 0.50, 0.40QC, 0.38, 0.32QC, 0.30RAD, 0.30VL, 0.30QC, 0.28, 0.26, 0.25APT, 0.25JRH, 0.24, 0.20, 0.18WW, 0.18Cape, 0.17APT, 0.16, 0.15, 0.13GS, 0.13Am, 0.11, 0.10

For 22 MDLs, Median is (0.25 + 0.24)/2 = 0.25 µg/L

2007
EPA Method 524.2
1,1,2-Trichloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.32	0.21	0.25	
Garden State	0.08			
Aqua ProTech	0.08	0.17		
JR Henderson	0.26	0.25	0.24	
Water Works	0.18			
Aqua PA	0.15			
American Water Lab Services	0.09			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJAL	0.50			
RaData	0.30			
Analytical Lab Services	0.23	0.12		
Aqua Pro Tech	0.08	0.17		
Cape Environ.	0.07	0.34		
Garden State	0.08			
Vineland	0.30			
QC	0.32	0.25	0.21	
South Jersey Water Test	0.28			
Precision Analytical	0.11	0.23	0.16	

Combined MDLS: 0.50, 0.34, 0.32QC, 0.30RAD, 0.30VL, 0.28, 0.26, 0.25QC, 0.25JRH, 0.24, 0.23ALS, 0.23Prec, 0.21QC, 0.18, 0.17APT, 0.16, 0.15, 0.12, 0.11, 0.09, 0.08APT, 0.08GS, 0.07

For 23 MDLs, Median is 0.23 µg/L

1,1,2-Trichloroethane Median MDLs (µg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	**0.25 (20)**	**0.25 (22)**	**0.23 (23)**	**0.24**

( ) = Number of MDLs considered for median

2005
EPA Method 524.2
1,3-Dichlorobenzene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	0.23			
Aqua Pro Tech	0.31			
JR Henderson	0.25	0.39	0.21	
Water Works	0.32			
AqPA	0.10			
American Water Lab Services	0.15			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.20			
RaData	0.20	0.30		
Analytical Lab Services	0.14	0.13		
Aqua Pro Tech	0.31			
Cape Environ.	0.12			
Garden State	0.23			
Vineland	0.35			
QC	0.30			
South Jersey Water Test	0.10	0.09		
Precision Analytical	0.15			

Combined MDLs: 0.39, 0.35, 0.32, 0.31APT, 0.30RAD, 0.30QC, 0.25, 0.23GS, 0.21, 0.20NJAL, 0.20RAD, 0.15Am, 0.15Prec, 0.14, 0.13, 0.12, 0.10SJWT, 0.10AqPA, 0.09SJWT

For 19 MDLs, Median is 0.20 µg/L

2006
EPA Method 524.2
1,3-Dichlorobenzene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30	0.26		
Garden State	0.15			
Aqua Pro Tech	0.31	0.12		
JR Henderson	0.39	0.21		
Water Works	0.32	0.18		
AqPA	0.11			
American Water Service Lab	0.15			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.20			
RaData	0.20	0.30		
Analytical Lab Services	0.14	0.16	0.20	
Aqua Pro Tech	0.31	0.12		
Cape Environ.	0.12			
Garden State	0.15			
Vineland	0.35			
QC	0.30	0.26		
South Jersey Water Test	0.10	0.35		
Precision Analytical	0.15			

Combined MDLs: 0.39, 0.35VL, 0.35SJWT, 0.32, 0.31APT, 0.30RAD, 0.30QC, 0.26QC, 0.21, 0.20NJAL, 0.20RAD, 0.20ALS, 0.18, 0.16, 0.15Am, 0.15Prec, 0.15GS, 0.14, 0.12APT, 0.12Cape, 0.11, 0.10SJWT

For 22 MDLs, Median is (0.20 +0.20)/2 = 0.20 µg/L

2007
EPA Method 524.2
1,3-Dichlorobenzene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.22	0.10	0.26	
Garden State	0.14			
Aqua Pro Tech	0.16	0.12		
JR Henderson	0.39	0.21	0.33	
Water Works	0.23	0.18		
AqPA	0.11			
American Water Lab Services	0.32			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJAL	0.20			
RaData	0.30			
Analytical Lab servcises	0.14	0.16	0.20	
Aqua Pro Tech	0.16	0.12		
Cape Environ.	0.37	0.03		
Garden State	0.14			
Vineland	0.35			
QC	0.10	0.26	0.22	
South Jersey Water Test	0.35			
Precision Analytical	0.15	0.13	0.14	

Combined MDLs: 0.39, 0.37, 0.35VL, 0.35SJWT, 0.33, 0.32, 0.30, 0.26QC, 0.23, 0.22QC, 0.21, 0.20NJAL, 0.20ALS, 0.18, 0.16APT, 0.16ALS, 0.15, 0.14Prec, 0.14ALS, 0.14GS, 0.13, 0.12APT, 0.11, 0.10QC, 0.03

For 25 MDLs, Median is 0.20 µg/L

1,3-Dichlorobenzene Median MDLs (µg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	**0.20 (19)**	**0.20 (22)**	**0.20 (25)**	**0.20**

( ) = Number of MDLs considered for median

2005
EPA Method 524.2
1,4-Dichlorobenzene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	0.22			
Aqua Pro Tech	0.38			
JR Henderson	0.26	0.33		
Water Works	0.21			
AqPA	0.13			
American Water Services Lab	0.17			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.20	0.30		
Analytical Lab Services Inc.	0.11	0.16		
Aqua Pro Tech	0.38			
Cape Environ.	0.12			
Garden State	0.22			
Vineland Lab	0.26			
QC	0.30			
South Jersey Water Test	0.10	0.09		
Precision Analytical	0.10			

Combined MDLs: 0.38APT, 0.33JRH, 0.30RAD, 0.30QC, 0.26JRH, 0.26VL, , 0.22GS, 0.21WW, 0.20, 0.17, 0.16, 0.13, 0.12, 0.11, 0.10NJAL, 0.10SJWT, 0.10Prec, 0.09

For 18 MDLs, Median is (0.20 + 0.17)/2 = 0.19 µg/L

2006
EPA Method 524.2
1,4-Dichlorobenzene

SDW Program MDLS (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30	0.26		
Garden State	0.11			
Aqua Pro Tech	0.38	0.10		
JR Henderson	0.26	0.33	0.20	
Water Works	0.20	0.21		
AqPA	0.12			
American Water Services Lab	0.15			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.20	0.30		
Analytical Lab Services Inc.	0.24	0.17	0.18	
Aqua Pro Tech	0.38	0.10		
Cape Environ.	0.12			
Garden State	0.11			
Vineland Lab	0.26			
QC	0.26	0.30		
South Jersey Water Test	0.10	0.34		
Precision Analytical	0.10			

Combined MDLS: 0.38APT, 0.34, 0.33, 0.30RAD, 0.30QC, 0.26JRH, 0.26QC, 0.26VL, 0.24 , 0.21, 0.20RAD, 0.20WW, 0.20JRH, 0.18, 0.17, 0.15, 0.12C, 0.12AQPA, 0.11GS, 0.10NJAL, 0.10SJWT, 0.10Prec, 0.10APT

For 23 MDLs, Median is 0.20 µg/L

2007
EPA Method 524.2
1,4-Dichlorobenzene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.25	0.26	0.09	
Garden State	0.22			
Aqua Pro Tech	0.11	0.10		
JR Henderson	0.26	0.33	0.20	
Water Works	0.20	0.32		
AqPA	0.12			
American Water Services Lab	0.27			

PWTA Program MDLs (µgL)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.30			
Analytical Lab Services	0.24	0.17	0.18	
Aqua Pro Tech	0.11	0.10		
Cape Environ.	0.37			
Garden State	0.22			
Vineland Lab	0.26			
QC	0.26	0.09	0.25	
South Jersey Water Testing	0.34			
Precision Analytical	0.10	0.18	0.12	

Combined MDLS: 0.37, 0.34, 0.33, 0.32, 0.30RAD, 0.27, 0.26QC, 0.26JRH, 0.26VL, 0.25QC, 0.24 , 0.22GS, 0.20JRH, 0.20WW, 0.18ALS, 0.18Prec, 0.17, 0.12Prec, 0.12AqPA, 0.11APT, 0.10NJAL, 0.10Prec, 0.10APT, 0.09QC

For 24 MDLs, Median is (0.22 + 0.20)/2 = 0.21 µg/L

1,4-Dichlorobenzene Median MDLs (µg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	**0.19 (18)**	**0.20 (23)**	**0.21 (24)**	**0.20**

( ) = Number of MDLs considered for median

2005
EPA Method 524.2
1,1-Dichloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	0.11			
Aqua ProTech	0.45			
JR Henderson	0.23	0.18	0.26	
Water Works	0.17	0.30		
Aqua PA	0.10			
American Water Lab Services	0.10			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytcal Lab	0.10			
RaData	0.30			
Analytical Lab Services Inc.	0.18	0.10		
Aqua Pro Tech	0.45			
Cape Environ.	0.07			
Garden State	0.11			
Vineland Lab	0.37			
QC	0.30			
South Jersey Water Test	0.11	0.10		
Precision Analytical	0.26			

Combined MDLs: 0.45APT, 0.37, 0.30RAD, 0.30QC, 0.30WW, 0.26JRH, 0.26Prec, 0.23, 0.18JRH, 0.18ALS, 0.17, 0.11GS, 0.11SJWT, 0.10SJWT, 0.10ALS, 0.10Am, 0.10AqPA,0.10NJAL, 0.07Cape

For 19 MDLs, Median is 0.18 µg/L

2006
EPA Method 524.2
1,1-Dichloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	0.11			
Aqua ProTech	0.45	0.17		
JR Henderson	0.26	0.18		
Water Works	0.17	0.30		
Aqua PA	0.19			
American Water Lab Services	0.10			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.30			
Analytical Lab Services Inc.	0.17	0.19	0.25	
Aqua Pro Tech	0.45	0.17		
Cape Environ.	0.07			
Garden State	0.11			
Vineland Lab	0.37			
QC	0.30			
South Jersey Water Test	0.10	0.42		
Precision Analytical	0.26			

Combined MDLS: 0.45APT, 0.42, 0.37, 0.30RAD, 0.30QC, 0.30WW, 0.26JRH, 0.26Prec, 0.25, 0.19AqPA, 0.19ALS, 0.18, 0.17APT, 0.17WW, 0.17Cape, 0.11GS, 0.10NJAL, 0.10Am, 0.10SJWT, 0.07Cape

For 20 MDLs, Median is (0.19 + 0.19)/2 = 0.19 µg/L

2007
EPA Method 524.2
1,1-Dichloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30	0.15	0.27	
Garden State	0.10			
Aqua ProTech	0.10	0.17		
JR Henderson	0.35	0.18	0.26	
Water Works	0.17	0.32		
Aqua PA	0.19			
American Water Lab Services	0.07			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.30			
Analytical Lab Services Inc.	0.17	0.19	0.25	
Aqua Pro Tech	0.10	0.17		
Cape Environ.	0.05	0.47		
Garden State	0.10			
Vineland Lab	0.37			
QC	0.30	0.15	0.27	
South Jersey Water Test	0.42			
Precision Analytical	0.26	0.11	0.15	

Combined MDLs: 0.47, 0.42, 0.37, 0.35, 0.32, 0.30RAD, 0.30QC, 0.27QC 0.26JRH, 0.26Prec, 0.25, 0.19AqPA, 0.19ALS, 0.18, 0.17APT, 0.17WW, 0.17ALS, 0.15QC, 0.15Prec, 0.11, 0.10GS, 0.10NJAL, 0.10APT, 0.07, 0.05

For 25 MDLs, Median is 0.19 µg/L

1,1-Dichloroethane Median MDLs (µg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	**0.18 (19)**	**0.19 (20)**	**0.19 (25)**	**0.19**

( ) = Number of MDLs considered for median

2005
EPA Method 524.2
1,1-Dichloroethene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	0.24			
Aqua Pro Tech	0.32			
JR Henderson	0.27	0.35		
Water Works	0.28	0.10		
AqPA	0.10			
American Water Services Lab	0.11			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.30	0.40		
Analytical Lab Services	0.17	0.18		
Aqua Pro Tech	0.32			
Cape Environ.	0.11			
Garden State	0.24			
Vineland Lab	0.34			
QC	0.30			
South Jersey Water Testing	0.12	0.10		
Precision Analytical	0.16			

Combined MDLs: 0.40, 0.35, 0.34, 0.32APT, 0.30QC, 0.30RAD, 0.28, 0.27, 0.24GS, 0.18, 0.17, 0.16, 0.12, 0.11AmW, 0.11Cape, 0.10WW, 0.10AqPA, 0.10NJAL, 0.10SJWT

For 19 MDLs, Median is 0.18 µg/L

2006
EPA Method 524.2
1,1-Dichloroethene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30	0.23		
Garden State	0.07			
Aqua Pro Tech	0.32	0.15		
JR Henderson	0.35	0.13		
Water Works	0.28	0.10		
AqPA	0.16			
American Water Services Lab	0.18			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.30	0.40		
Analytical Lab Services	0.17	0.20	0.15	
Aqua Pro Tech	0.32	0.15		
Cape Environ.	0.11			
Garden State	0.07			
Vineland Lab	0.34			
QC	0.23	0.30		
South Jersey Water Testing	0.38	0.10		
Precision Analytical	0.16			

Combined MDLs: 0.40, 0.38, 0.35, 0.34, 0.32APT, 0.30QC, 0.30RAD, 0.28WW, 0.23QC, 0.20, 0.18 0.17, 0.16Prec, 0.16AqPA, 0.15ALS, 0.15APT, 0.13, 0.11, 0.10SJWT, 0.10NJAL, 0.10WW, 0.07GS

For 22 MDLs, Median is (0.17 + 0.18)/2 = 0.18 µg/L

2007
EPA Method 524.2
1,1-Dichloroethene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.18	0.23	0.31	
Garden State	0.07			
Aqua Pro Tech	0.19	0.15		
JR Henderson	0.35	0.13		
Water Works	0.10	0.20		
AqPA	0.16			
American Water Services Lab	0.14			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.40			
Analytical Lab Services	0.17	0.20	0.15	
Aqua Pro Tech	0.19	0.15		
Cape Environ.	0.06	0.47		
Garden State	0.07			
Vineland Lab	0.34	0.25		
QC	0.31	0.18	0.23	
South Jersey Water Testing	0.38			
Precision Analytical	0.16	0.35	0.13	

Combined MDLS: 0.47, 0.40, 0.38, 0.35Prec, 0.35JRH, 0.34, 0.31QC, 0.25, 0.23QC, 0.20WW, 0.20ALS, 0.19APT, 0.18QC, 0.17, 0.16Prec, 0.16AqPA, 0.15APT, 0.15ALS, 0.14, 0.13Prec, 0.13JRH, 0.10WW, 0.10NJAL, 0.07GS, 0.06

For 25 MDLs, Median is 0.18 µg/L

1,1-Dichloroethene Median MDLs (µg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	**0.18 (19)**	**0.18 (22)**	**0.18 (25)**	**0.18**

( ) = Number of MDLs considered for median

2005
EPA Method 524.2
1,2,4-Trichlorobenzene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	0.31			
Aqua Pro Tech	0.40			
JR Henderson	0.28	0.34	0.46	
Water Works	0.25			
AqPA	0.15			
American Water Services Lab	0.27			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analtyical Lab	0.30			
RaData	0.20	0.30		
Analytical Lab Services	0.19	0.21		
Aqua Pro Tech	0.40			
Cape Environ.	0.13			
Garden State	0.31			
Vineland Lab	0.26			
QC	0.30			
South Jersey Water Test	0.10	0.09		
Precision Analytical	0.18			

Combined MDLs: 0.46, 0.40APT, 0.34, 0.31GS, 0.30RAD, 0.30NJAL, 0.30QC, 0.28, 0.27, 0.26, 0.25, 0.21, 0.20, 0.19, 0.18, 0.15, 0.13, 0.10, 0.09

For 19 MDLs, Median is 0.26 µg/L

2006
EPA Method 524.2
1,2,4-Trichlorobenzene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30	0.26		
Garden State	0.09			
Aqua Pro Tech	0.40	0.22		
JR Henderson	0.34	0.46		
Water Works	0.25			
AqPA	0.10			
American Water Services Lab	0.17			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analtyical Lab	0.30			
RaData	0.20	0.30		
Analytical Lab Services	0.16	0.15		
Aqua Pro Tech	0.40	0.20		
Cape Environ.	0.13			
Garden State	0.09			
Vineland Lab	0.26			
QC	0.30	0.26		
South Jersey Water Test	0.10	0.29		
Precision Analytical	0.18			

Combined MDLS: 0.46, 0.40APT, 0.34, 0.30RAD, 0.30NJAL, 0.30QC, 0.29, 0.26QC, 0.26VL, 0.25, 0.22, 0.20RAD, 0.20APT, 0.18, 0.17, 0.16, 0.15, 0.13, 0.10AqPA, 0.10SJWT, 0.09GS

For 21 MDLs, Median is 0.22 µg/L

2007
EPA Method 524.2
1,2,4-Trichlorobenzene

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.18	0.26	0.16	
Garden State	0.30			
Aqua Pro Tech	0.28	0.22		
JR Henderson	0.34	0.46	0.45	
Water Works	0.25	0.28		
AqPA	0.10			
American Water Services Lab	0.21			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analtyical Lab	0.30			
RaData	0.30			
Analytical Lab Services	0.16	0.15		
Aqua Pro Tech	0.28	0.20		
Cape Environ.	0.16	0.48		
Garden State	0.30			
Vineland Lab	0.26			
QC	0.16	0.26	0.18	
South Jersey Water Test	0.29			
Precision Analytical	0.18	0.36	0.30	

Combined MDLS: 0.48, 0.46, 0.45, 0.36, 0.34, 0.30RAD, 0.30NJAL, 0.30GS, 0.30Prec, 0.29, 0.28APT,0.28WW, 0.26QC, 0.26VL, 0.25, 0.22, 0.21, 0.20, 0.18QC, 0.18Prec, 0.16QC, 0.16Cape, 0.16ALS, 0.15, 0.10

For 25 MDLs, Median is 0.26 ug/L

1,2,4-Trichlorobenzene Median MDLs (µg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	**0.26 (19)**	**0.22 (21)**	**0.26 (25)**	**0.25**

( ) = Number of MDLs considered for median

2005
EPA Method 524.2
Methylene Chloride

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.50			
Garden State	0.13			
Aqua Pro Tech	0.42			
JR Henderson	0.19			
Water Works	0.33			
AqPA	0.45			
American Water Services Lab	0.09			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.20			
RaData	0.30			
Analytical Lab Services	0.08	0.06		
Aqua Pro Tech	0.42			
Cape Environ.	0.14			
Garden State	0.13			
Vineland Lab	0.32			
QC	0.50			
South Jersey Water Test	0.09	0.10		
Precision Analytical	0.24			

Combined MDLS: 0.50QC, 0.45, 0.42APT, 0.33, 0.32, 0.30, 0.24, 0.20, 0.19, 0.14, 0.13GS, 0.10, 0.09Am, 0.09SJWT, 0.08, 0.06

For 16 MDLs, Median is 0.20 µg/L

2006
EPA Method 524.2
Methylene Chloride

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.50			
Garden State	0.09			
Aqua Pro Tech	0.42	0.14		
JR Henderson	0.19			
Water Works	0.10			
AqPA	0.30			
American Water Services Lab	0.19			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.20			
RaData	0.30			
Analytical Lab Services	0.24	0.21	0.30	
Aqua Pro Tech	0.42	0.14		
Cape Environ.	0.14			
Garden State	0.09			
Vineland Lab	0.32			
QC	0.50			
South Jersey Water Test	0.45			
Precision Analytical	0.24			

Combined MDLS: 0.50QC, 0.45, 0.42APT, 0.32, 0.30RaD, 0.30AqPa, 0.30ALS, 0.24ALS, 0.24Prec, 0.21, 0.20, 0.19AmW, 0.19JRH, 0.14APT, 0.14Cape, 0.10, 0.09GS

For 17 MDLs, Median is 0.24 µg/L

2007
EPA Method 524.2
Methylene Chloride

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.50			
Garden State	0.06			
Aqua Pro Tech	0.22	0.14		
JR Henderson	0.20			
Water Works	0.10	0.34		
AqPA	0.30			
American Water Services Lab	0.19			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.20			
RaData	0.30			
Analytical Lab Services	0.24	0.21	0.30	
Aqua Pro Tech	0.22	0.14		
Cape Environ.	0.48	0.07		
Garden State	0.06			
Vineland Lab	0.23			
QC	0.50			
South Jersey Water Test	0.10			
Precision Analytical	0.24	0.38	0.15	

Combined MDLS: 0.50QC, 0.48, 0.38, 0.34, 0.30RaD, 0.30AqPa, 0.30ALS, 0.24ALS, 0.24Prec, 0.23, 0.22APT, 0.21, 0.20NJAL, 0.20JRH, 0.19, 0.15, 0.14APT, 0.10WW, 0.10SJWT, 0.07, 0.06GS

For 21 MDLs, Median is 0.22 µg/L

Methylene Chloride Median MDLs (µg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	**0.20 (16)**	**0.24 (17)**	**0.22 (21)**	**0.22**

( ) = Number of MDLs considered for median

2005
EPA Method 524.2
1,1,1-Trichloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	0.14			
Aqua ProTech	0.21			
JR Henderson	0.26	0.32	0.16	
Water Works	0.18			
Aqua PA	0.12	0.25		
American Water Lab Services	0.12			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.30			
Analytical Lab Servics	0.15			
Aqua ProTech	0.21			
Cape Environmental	0.09			
Garden State	0.14			
Vineland	0.21			
QC	0.30			
South Jersey Water Testing	0.12	0.24	0.10	
Precision Analytical	0.15			

Combined MDLs*:* 0.09, 0.10NJAL, 0.10SJWT, 0.12 AqPA, 0.12AWSI, 0.12SJWT, 0.14GS, 0.15Prec, 0.15ALSI, 0.16, 0.18, 0.21APT, 0.21Vineland, 0.24, 0.25, 0.26, 0.30QC, 0.30RaD, 0.32

For 19 MDLs, Median is 0.16 µg/L

2006
EPA Method 524.2
1,1,1-Trichloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.27	0.30		
Garden State	0.11			
Aqua ProTech	0.21	0.14		
JR Henderson	0.16	0.32		
Water Works	0.18	0.12		
Aqua PA	0.12	0.20		
American Water Lab Services	0.23			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.30			
Analytical Lab Servics	0.22			
Aqua ProTech	0.21	0.14		
Cape Environmental	0.46	0.09		
Garden State	0.11			
Vineland	0.21			
QC	0.30			
South Jersey Water Testing	0.12	0.10	0.34	
Precision Analytical	0.15			

Combined MDLs*:* 0.09, 0.10NJAL, 0.10SJWT, 0.11GS, 0.12SJWT, 0.12WW, 0.12AqPA, 0.14, 0.15, 0.16, 0.18, 0.20, 0.21APT, 0.21Vinel, 0.22, 0.23, 0.27QC, 0.30QC, 0.30RaD, 0.32, 0.34, 0.46

For 22 MDLs, Median is(0.18 + 0.20)/2 = 0.19 µg/L

2007
EPA Method 524.2
1,1,1-Trichloroethane

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.27	0.15	0.25	
Garden State	0.05			
Aqua ProTech	0.14	0.16		
JR Henderson	0.16	0.32	0.45	
Water Works	0.12	0.20		
Aqua PA	0.20			
American Water Lab Services	0.17			

PWTA Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
NJ Analytical Lab	0.10			
RaData	0.30	0.50		
Analytical Lab Servics	0.22			
Aqua ProTech	0.14	0.16		
Cape Environmental	0.46	0.33		
Garden State	0.05			
Vineland	0.21			
QC	0.27	0.15	0.25	
South Jersey Water Testing	0.34			
Precision Analytical	0.15	0.17	0.11	

Combined MDLs*:* 0.05, 0.10, 0.12, 0.14, 0.15QC, 0.16APT, 0.16JRH, 0.17Prec, 0.17AmW, 0.20AqPA, 0.20WW, 0.21, 0.22, 0.25QC, 0.27QC, 0.30, 0.32, 0.33, 0.34, 0.45, 0.50

For 21 MDLs, Median is 0.20 µg/L

1,1,1-Trichloroethane Median MDLs (µg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	**0.16 (19)**	**0.19 (22)**	**0.20 (21)**	**0.18**

( ) = Number of MDLs considered for median

2005
EPA Method 524.2
Methyl Ethyl Ketone

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30			
Garden State	NA	NA	NA	NA
Aqua ProTech	0.15			
JR Henderson	NA			
Water Works	0.24			
Aqua PA	NA	NA	NA	NA
American Water Lab Services	1.11			

Combined MDLs: 0.15, 0.24, 0.30, 1.11

For 4 MDLs, Median is 0.27 µg/L

2006
EPA Method 524.2
Methyl Ethyl Ketone

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.30	1.17		
Garden State	NA	NA	NA	NA
Aqua ProTech	0.74	0.15		
JR Henderson	0.20			
Water Works	0.24	0.33		
Aqua PA	NA	NA	NA	NA
American Water Lab Services	1.68			

Combined MDLs: 0.15, 0.20, 0.24, 0.30, 0.33, 0.74, 1.17, 1.68

For 8 MDLs, Median is 0.32 µg/L

2007
EPA Method 524.2
Methyl Ethyl Ketone

SDW Program MDLs (µg/L)

Lab	MDL	MDL	MDL	MDL
QC	0.35	1.17	0.94	1.32
Garden State	NA	NA	NA	NA
Aqua ProTech	0.74	0.81		
JR Henderson	0.16			
Water Works	0.33	0.36		
Aqua PA	NA	NA	NA	NA
American Water Lab Services	1.53			

Combined MDLs: 0.16, 0.33, 0.35, 0.36, 0.74, 0.81, 0.94, 1.17, 1.32, 1.53

For 10 MDLs, Median is 0.78 µg/L

Methyl Ethyl Ketone Median MDLs (µg/L) by year

Method	2005	2006	2007	Average of Medians
524.2	0.27 (4)	0.32 (8)	0.78 (10)	0.46

( ) = Number of MDLs considered for median