Final
Monitored Natural Attenuation Assessment

Mohonk Road Industrial Plant
Superfund Site

Prepared
For
U.S. Environmental Protection Agency

Prepared
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U.S. Army Corps of Engineers

April 11, 2008

US Army
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US Environmental
Protection Agency

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Acronyms

BTEX	Combined Benzene, Toluene, Ethyl Benzene, and Xylenes
Cis-1,2-DCE	Cis-1,2-dichloroethylene
1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethylene
DCAs	Dichloroethanes
DCEs	Dichloroethenes
DO	Dissolved Oxygen
E&E	Ecology and Environment
EPA	US Environmental Protection Agency
MNA	Monitored Natural Attenuation
MRIP	Mohonk Road Industrial Plant
ORP	Oxidation-Reduction Potential
ppb	Parts per Billion
COC	Contaminant of Concern
MAROS	Monitoring and Remediation Optimization System (Air Force)
NPL	National Priority List
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
MCL	Maximum Contaminant Level
MW	Monitoring Well
R^2	Pearson's Correlation Coefficient
RI	Remedial Investigation
ROD	Record of Decision
SVOCs	Semi-volatile Organic Compounds
1,1-TCA	1,1,I-Trichloroethane
TCE	Trichloroethylene
TOC	Total Organic Carbon
USACE	United States Army Corps of Engineers

I. INTRODUCTION

The Mohonk Road Industrial Plant (MRIP) Superfund Site (the Site) is located in the Hamlet of High Falls, Ulster County, New York, approximately 7 miles north-northwest of the Village of New Paltz and 10 miles south-southwest of the City of Kingston (Figure 1). The Site was placed on the National Priorities List (NPL) on January 19, 1999, with the United States Environmental Protection Agency (EPA) assuming lead agency role with issuance of the Record of Decision (ROD), which was signed on March 31, 2000. The Site includes the Mohonk Road Industrial Plant property located at 186 Mohonk Road (the MRIP property), and all surrounding properties that have been impacted by a contaminated groundwater plume emanating from the MRIP property. The MRIP property consists of approximately 14.5 acres of mostly undeveloped land with a 43,000 square foot building in its southern corner, with the Site-related chlorinated solvent groundwater plume extending approximately 4,000 feet from the MRIP property (Figure 2). The off-MRIP (far-field) portion of the plume impacted numerous private water supply wells. To the north of the far-field plume and residential properties is Rondout Creek, with public land formerly associated with the Dam on the Creek lying between the private land to the south and the Creek.

The major source of contamination for the groundwater plume is believed to have been a 1000-gallon disposal tank, which was removed by New York State Department of Environmental Conservation (NYSDEC) in 1997 along with 25 tons of contaminated soil. The tank was located approximately 100 feet north of the former MRIP building at the present location of monitoring well MW-4 (Figure 2). In response to a request by NYSDEC in 1998, EPA conducted a non-time critical removal action (NTCRA), which involved construction of a groundwater extraction and treatment system designed to minimize the further migration of the most highly contaminated portion of the groundwater plume in the bedrock aquifer.

The selected remedy in the ROD designated the following for the Site:

- Construction and operation of a new public water supply system to supply water to those with impacted or threatened private supply wells
- Active remediation of contaminated groundwater by extraction and treatment. This included operation of the NTCRA system to address the near-field plume around the source, and installation of a separate extraction and treatment system to address the portion of the plume off MRIP property plume down-gradient from the source (the far-field plume)
- Additional contaminated soil removal and disposal
- Long-term groundwater monitoring

The near-field pump-and-treat system was installed and has been operating since February 2001. Recently (2007), all residences with water supply wells within the Water District (Figure 1) surrounding the Site were connected to a public water supply. The additional soil removal designated in the ROD was completed in September 2000. In addition, six sub-slab vapor mitigation systems to address TCE indoor air levels within the commercial building at the Site have also been installed and have been operating since February 2007. Groundwater

monitoring was initiated in 1999 and is continuing on a semi-annual basis. The monitoring has indicated groundwater contaminant concentration trends that are either decreasing or stable. These trends indicate the potential that monitored natural attenuation (MNA), in conjunction with the public water supply, the soil source removals, and the near-field pump-and-treat system, may be adequate in remediating the far-field plume without the additional pump-and-treat system prescribed in the ROD. In addition to the remediation that is continuing or has been performed, increases in the extraction rates for the near-field pump-and-treat system and additional soil source removal consisting of a soil vapor extraction system have recently been implemented (January and February 2008, respectively). These remedial augmentations further increase the potential that MNA for the far-field plume will be an effective remedial approach without the need for a far-field pump-and-treat system.

At the request of EPA and the U.S. Army Corps of Engineers (USACE) Kansas City District, an evaluation of the potential for MNA to substitute for the far-field pump-and-treat system has been performed. The evaluation includes data collected through April 2007 (Attachment 1). The evaluation includes assessment of trends in contaminant concentrations, geochemical conditions, and the relationship between the geochemical conditions and contaminant degradation at the Site and assesses whether MNA is suitable to substitute for the far-field pump-and-treat system.

II. GEOLOGIC AND HYDROGEOLOGIC SETTING

The following summary of the geologic and hydrogeologic setting of the Site was derived from a memorandum written by Ecology and Environment Engineering (E&E 2001; included as Attachment 2 of this report), which drew on numerous sources, including the *Work Plan for Groundwater Treatment System and Backup Municipal Water Supply Pre-Design Analysis* (E & E 2001), the RI report by Lawler, Matusky & Skelly (LMS 1998), and *Hydrogeology of the Northern Shawangunk Mountains, Ulster County, New York* by Coates et al. (1994). The study area is in the northern Shawangunk Mountains and is underlain by glacial till and the bedrock Shawangunk formation.

The bedrock unit consists of Middle Silurian, white to light gray, interbedded orthoquartzitic conglomerates, sandstones, siltstones, with lenses of red and green shales. In the vicinity of the Site, the Shawangunk formation is divided into three members: Upper and Lower Members consisting of interbedded, orthoquartzitic, conglomeritic sandstone, separated by a gray to red to green sandstone, siltstone, and shale. Laterally discontinuous shale layers were identified in several monitoring wells. The thickness of the Shawangunk formation ranges from 140 to 350 feet and may be thicker outside of the study area. The deepest monitoring wells near the site are approximately 200 feet deep (minimum elevation of 22 feet above mean sea level) and terminate in Shawangunk orthoquartzite.

Orthoquartzite is a sedimentary rock composed primarily of detrital quartz sand and gravel, with silica cementing the grains together. In the Shawangunk formation, nearly all pore spaces are completely cemented by silica creating a very hard rock and leaving essentially no primary porosity within the rock.

Although the Shawangunk Formation has been subjected to thrust and strike-slip faulting, the structural domain of the bedrock in the vicinity of the Site is dominated by folding. With respect to the hydrogeologic setting of the Site, the most important fracture types are joints and bedding plane discontinuities. A series of gently plunging open folds trend northeast. The four major drainage basins within the Shawangunks, including the Coxing Kill, are formed within the synclines of these folds. The Site is located along the crest of the anticline adjacent to the Coxing Kill syncline. Associated with these folds is a set of pervasive, nearly vertical, northeast-southwest trending joints parallel to the fold axis. These joints are most commonly associated with extension along anticlinal fold axes and may extend continuously from several tens to thousands of feet. Where present, these joints intercept fractures of other orientations. The joints also intercept nearly horizontal bedding plane fractures. These fractures are associated with the release of pressure caused by glacial unloading.

A bedrock groundwater contour map of the area (see Figure 3) reveals that groundwater flow generally mimics topography, which itself is structurally controlled by the northeast trending anticline on which the Site exists. In general, groundwater flow is to the north-northeast, with some easterly and westerly components of flow toward Coxing Kill to the east and Rondout Creek to the west. This flow pattern is generally consistent with what would be expected based on presence of a dominant fracture set trending northeast-southwest with a conjugate and less prevalent fracture set trending northwest-southeast. For comparison, the E&E tech memo (Attachment 2) contains groundwater contour maps from December 1997 to June 2001. Well construction details and the December 2007 water level data are provided in Attachment 3. The primary difference between the historical groundwater contours maps and the 2007 map is broader influence of the extraction wells in the near-field, suggesting a slightly larger capture zone. It should be noted, though, that the datasets used to create the maps are not strictly comparable, given that the 2007 map incorporates wells installed since 2001.

III. DATA ANALYSIS

The major focus of this analysis will be the chlorinated solvents present in the groundwater at the Site. Also present in the groundwater is 1,4-dioxane. No 1,4-dioxane cleanup level was designated in the ROD. For the discussion here, the New York State default value for semivolatile organic compounds (SVOCs) of 50 μg/L was used. As there is only one location near the source area that is presently above 50 μg/L, with all far-field 1,4-dioxane concentrations well below 50 μg/L, 1,4-dioxane is discussed only briefly in Section III-B.

A. Chlorinated Solvents

In order to assess the natural attenuation of chlorinated solvents, data associated with the following lines of MNA evidence are evaluated:

1) The presence of daughter compounds, such as dichloroethenes (DCEs), dichloroethanes (DCAs), ethene, ethane, and chloride.
2) Contaminant concentration changes with time.
3) Contaminant concentration changes with distance, in particular concentration changes along the centerline of the plume, in direction of down-gradient flow.
4) Geochemical conditions for the possible degradation processes, which include reductive dechlorination, abiotic dehydrohalogenation, cometabolism, and oxidative mineralization, that may occur, and the presence of biological activities, which are verified by identifying the following in groundwater:
    a. The consumption of electron acceptors including oxygen, nitrate, ferric iron, sulfate, and carbon dioxide.
    b. The presence of electron donors such as natural organic substrates and easily degraded organic contaminants such as benzene, toluene, ethylbenzene, and xylenes that can provide microbes with sufficient energy and carbon sources.

Analytical or numerical modeling or statistical analysis of concentration over time data can also be used to demonstrate that the down-gradient receptors are not impacted by the migrating plume and the natural attenuation processes can achieve the remedial goals within a reasonable timeframe. Neither numerical or analytical modeling was performed at this Site because of the complex history of source and groundwater remediation; the limited amount of contaminant over time data in some of the wells in the far-field; and the difficulty in accurately modeling contaminant transport in the fractured bedrock present at the Site. Instead, the degradation rates and the time required to achieve remedial goals have been estimated using first-order kinetics. This method involves calculation of first-order rate constants based on the contaminant concentration vs. time behavior at individual wells[1]. It is noted that the concentration decreases are due to a number of different processes, including extraction in the near-field, and dispersion and degradation in the far-field. Therefore, the first-order rate constants are not directly related to any specific attenuation process but are general predictors of the expected future decrease in contaminant concentrations over time due to all processes. In addition to the first-order rate constant calculation, the contaminant concentration vs. time data have been analyzed statistically for evidence of the stable or decreasing contaminant concentration trends over time that support MNA.

Groundwater samples have been collected from monitoring wells in the source area (near-field), the contaminant plume outside the source area (the far-field), and from wells outside of the plume footprint (far down-gradient wells) as shown on Figure 2. The sampling was initiated in 1999, with additional wells added over time to the monitoring network to provide the data necessary for evaluating MNA. Four residential wells were added to the monitoring program in October 2006. These wells were sampled again in April 2007, along with two additional residential wells. The residential locations were chosen to fill in data gaps within the monitoring well network. Four of the well locations

[1] The methodology used in the first-order rate constant calculations is included in Attachment 4

(GAC/RW-29, GAC/RW-41, GAC/RW-58), and GAC/RW-73) are located in the far-field plume area. The other two locations (GAC/RW-21 and GAC/RW-60) are in the vicinity of the far down-gradient well MW-14B (Figure 2). It is noted that the residential well data, although useful for general plume definition, are not directly comparable to the monitoring well data because of differences in well construction.

The 2001 ROD cleanup level specified for 1,1,1-TCA, 1,1-DCE, cis-1,2-DCE, and 1,1-DCA is 5 ppb. Since only two wells at the Site have cis-1,2-DCE above 5 ppb (MW-4 at a maximum concentration of 10 ppb and MW 17-3 with a maximum concentration of 5.8 ppb), no further discussion of cis-1,2-DCE is included in this MNA evaluation, except as an indicator of the amount of degradation of TCE that is occurring. Also, vinyl chloride, which has been detected sporadically (one near-field and two far-field locations), is discussed as a secondary daughter product of TCE; no cleanup level was specified in the ROD but, using the Federal MCL of 2 μg/L as a reference, all detections have been at or below the Federal MCL. In addition, carbon tetrachloride is also present at the Site but the October 2006 and April 2007 data show only one well, MW-5B, located in the near-field, at concentrations over the Federal MCL and New York State cleanup level of 5 μg/L.[2] As with cis-1,2-DCE, no further discussion of carbon tetrachloride is included in this evaluation except to use the carbon tetrachloride data and the data indicating the presence of its daughter products to support the occurrence of chlorinated solvent degradation.

1. Presence of Chlorinated Solvent Daughter Products

The primary parent chlorinated solvents present at the Site are 1,1,1-trichloroethane (1,1,1-TCA) and trichloroethene (TCE). Degradation of 1,1,1-TCA and TCE has occurred at the Site as evidenced by the daughter products of 1,1,1-TCA, which include 1,1-dichloroethene (1,1-DCE), which forms independently of geochemical conditions in the groundwater, and 1,1-dichloroethane (1,1-DCA), which forms under reducing geochemical conditions (see Figure 4 for site-specific degradation pathways). The daughter product of 1,1-DCE under reducing conditions, vinyl chloride, is also present in localized areas with relatively strongly reducing conditions. Scattered low levels of chloroethane, the primary daughter product of 1,1-DCA and secondary daughter product of 1,1,1-TCA, are also present in areas of reducing conditions. Ethane, the ultimate innocuous daughter product of 1,1,1-TCA, is also present, suggesting that complete dechlorination of 1,1,1-TCA is occurring at the Site. Low levels of the daughter product of TCE, cis-1,2-dichloroethene (cis-1,2-DCE), which forms under reducing geochemical conditions, are also present. Vinyl chloride, a daughter product of cis-1,2-DCE as well as 1,1-DCE, appears to be present primarily as a daughter product of 1,1-DCE. In addition to the daughter products of 1,1,1-TCA and TCE, all the daughter products of carbon tetrachloride [chloroform, methylene chloride, chloromethane, and methane[3] (ITRC 1997)] are present at the site, suggesting that complete dechlorination of both carbon tetrachloride and 1,1,1-TCA is occurring at the Site.

[2] No cleanup level for carbon tetrachloride was designated in the ROD.

[3] The presence of methane may also be due in part or in total to the production of methane under methanogenic conditions by reduction of carbon dioxide.

2. Chlorinated Solvent Contaminant Concentration Changes with Time

The concentrations of 1,1,1-TCA, TCE, 1,1-DCE, and 1,1-DCA from October 1999 through April 2007 are shown in Figure 5 for the extraction wells and monitoring wells with chlorinated solvent concentrations consistently above the ROD cleanup levels. Also included in Figure 5 are the 1,1-DCA concentrations at MW-14B, which have shown consistently low 1,1-DCA concentrations (approximately 1 μg/L) below the ROD cleanup level of 5 μg/L. 1,1,1-TCA, TCE, and 1,1-DCE have had all low or non-detect concentrations in MW-14B over the same monitoring time period. The data from MW-14B were included to assess the stability of the contaminant concentrations at the far down-gradient edge of the plume.

These data were evaluated quantitatively by performing regressions in Microsoft Excel on the concentration over time data assuming first-order kinetics (Figure 6)[1]. The regression lines are shown on the graphs, along with the regression equations. The results from the regressions and statistical analyses are also summarized in Tables 1-4, respectively, for 1,1,1-TCA, 1,1-DCE, 1,1-DCA, and TCE. The tables include the rate constants and half-lives, the amount of time estimated to reach the ROD cleanup goals, and the squares of Pearson's correlation coefficient (R^2) for the regressions. The latter indicates the agreement between the regression line and the data, with a perfect match having an R^2 of 1 and no correlation between the regressed line and the data having an R^2 of 0.

As Pearson's R measures only a linear association between two variables and also requires normality (which was not tested), the statistical program MiniTab was also used to evaluate trends using the non-parametric correlation coefficient Kendall's tau (which requires neither normality nor linearity).[4] The bold print in Tables 1-4 indicates that a statistically significant trend was observed at minimally the 90% confidence level; italics indicate that the calculated trend was not statistically significant. Apparent trends that are not statistically significant may be of little or no predictive value. Therefore, predicted remediation times were not included for wells that did not show significant trends.

In addition to the evaluation of the concentration of individual chemical constituents over time (time series plots), graphs of the overall ratios of daughter to parent products over time throughout the plume were also prepared (Figure 7). These graphs help assess the relative effects of the pump-and-treat operation to the contaminant degradation in the near- and far-fields. These are discussed further below.

Tables 1-4, along with the trends observed in Figures 5 and 6, indicate that the 1,1,1-TCA and TCE concentrations have generally declined at wells located both in the near-field and the far-field. In particular, all wells with TCE concentrations over the 5 ppb cleanup level, except MW-5B, are showing statistically significant decreasing trends, with projected times to reach the TCE cleanup level in 56 years or less in the near-field and 16

[4] Description of the procedures used in the MiniTab evaluation are included in Attachment 4, with the MiniTab statistical evaluations included in Attachment 5.

years or less in the far-field. Similarly, all wells with 1,1,1-TCA over the cleanup level of 5 ppb, except MW-5B and MW 17-3, are showing significant decreasing trends, with projected times to reach the cleanup level in 25 years or less for the near-field and 44 years or less for the far-field. However, it should be noted that these projected time estimates should be considered rough estimates only. The rate constants and the projected times derived from these values possess significant uncertainties (e.g., the data sets are relatively small, regression analysis is not necessarily the optimal approach to evaluate trends for all the wells, and the evaluation excludes wells that do not exhibit decreasing trends).

The trend evaluations for 1,1-DCE and 1,1-DCA (Tables 2 and 3) show a much larger percentage of wells (~70%) without statistically significant trends, particularly in the far-field. This can be explained in part by the first-order rate constants for 1,1-DCA and 1,1-DCE incorporating both production (formation from degradation of 1,1,1-TCA) and attenuation (physical processes and chemical transformations). It is expected that as the flux of 1,1,1-TCA decreases, the 1,1-DCE and 1,1-DCA concentrations will decrease with time, both as a result of continuing dispersion and degradation of 1,1-DCE and 1,1-DCA and the diminishing production of 1,1-DCA and 1,1-DCE from degradation of 1,1,1-TCA. With the additional source removal recently implemented, and increased extraction rates in the near-field pump-and-treat system, further reduction of 1,1,1-TCA flux in the far-field is expected. Even without these remedial augmentations, all the wells that exhibited statistically significant trends also showed decreasing concentrations.

The general contaminant decreases, particularly in the near-field, indicate the effectiveness of the near-field pump-and-treat. The continued high concentrations of 1,1,1-TCA and TCE at MW-5B and MW-4 are attributed to the presence of a vadose zone source continuing to contribute groundwater contamination near the source under the MRIP building. A soil vapor extraction system to remove this source has been operating since February 2008. It is expected that the projected times to achieve cleanup goals will decrease significantly with the additional source removal. It is also expected that additional source removal will decrease the amount of 1,1,1-TCA migrating to the far-field, resulting in daughter product to parent ratios in the far-field comparable to the relatively constant ratios present in the near-field (Figure 7).

3. Concentration Changes with Distance

The source area is currently under hydraulic control, and the remaining dissolved-phase contaminant plume has migrated in a generally northerly direction toward Rondout Creek, following the principal direction of groundwater flow. The April 2007 VOC data indicate the limits of the plume are generally defined in all directions (Figure 2). Some uncertainty exists to the east and northeast due to lack of monitoring points; installation of an additional monitoring well on the east side of the Site is planned for 2008 to supply additional data in this area. Figures 8 and 9 show the decreases in 1,1,1-TCA (Figure 8) and TCE (Figure 9) concentrations in the down-gradient direction. 1,1,1-TCA and TCE concentrations above the remedial goals (5 ppb) are currently present in both the near-field and far-field areas. Only low-level detections of 1,1-DCE (Figure 10) and/or 1,1-

DCA (Figure 11) have been found in the far down-gradient wells, with low level or non-detect concentrations of 1,1,1-TCA and TCE (Figures 8 and 9). Vinyl chloride, the dechlorination product of 1,1-DCE and 1,2-DCE, has been detected sporadically in one location in the near-field, well MW-4, and two residential wells, GAC/RW-21 and GAC/RW-58, in the far-field. All concentrations have been at or below the Federal MCL of 2 μg/L.

Viability of MNA as a remedy depends, in part, on demonstration that a dissolved-phase plume is stable or shrinking. For the Site, evaluation of plume stability at the distal margins is hampered somewhat by low monitoring well density and insufficient data for residential wells to identify statistically significant contaminant concentration trends. However, at MW-14B, the furthest down-gradient monitoring well in the far-field with evidence of contamination, data have shown stable concentrations (≤1 μg/L) of 1,1-DCA, and non-detect or very low 1,1,1-TCA, TCE, and 1,1-DCE since 2001 (Figure 5). Residential wells up-gradient of MW-14B—GAC/RW-60, -21, -58, and -29—provide no suggestion, based on two years of monitoring, of increasing trends in any of the contaminants. In addition, all wells in the far-field with statistically significant trends show decreasing chlorinated solvent concentrations. Continued monitoring is necessary to confirm the preliminary conclusion that the plume is stable at the down-gradient margins. However, given the generally decreasing or stable concentrations within the plume closer to the source, it is expected that the margins will shrink or, at worst, remain stable for the foreseeable future. The increased NTCRA extraction rates and the additional source removal increase the likelihood that the plume margins will shrink in the future.

4. Geochemical Conditions

The evaluation of the Site geochemical conditions is important in verifying the presence and location of appropriate redox conditions necessary for reductive dechlorination to occur and to continue to occur in the future. The reductive dechlorination of chlorinated solvents occurs under reducing conditions where oxygen is not present (i.e., anaerobic environment). The presence of methane strongly indicates a location is under reducing conditions. In an area with a suitable carbon source and where biological activity is present, oxygen will be utilized as the first electron acceptor by microbes to sustain microbial growth. Once the oxygen is depleted, any available nitrate would then be utilized by microbes. Next, ferric iron and sulfate would be utilized and, finally, carbon dioxide would be the last electron acceptor to be utilized by microbes. Typically, chlorinated solvents can compete as electron donors under iron- to sulfate-reducing conditions; therefore, degradation of chlorinated solvents is possible under these conditions.

Dissolved oxygen (DO) is the indicator for the presence of oxygen, while nitrate as nitrogen is monitored to directly indicate the presence of nitrate. Ferrous iron is monitored as a metabolic byproduct of ferric iron reduction. Sulfate is monitored directly, and methane is monitored as a metabolic byproduct of carbon dioxide reduction. As the environment becomes increasingly reducing, the following geochemical

conditions result. Dissolved oxygen levels become low, followed by decreased nitrate, increasing ferrous iron, diminished sulfate, and finally increasing methane concentrations. Low (generally negative) oxidation-reduction potential (ORP) is an indicator of the anaerobic conditions. In addition to electron acceptors, electron donors (organic substrates) also need to be available for reductive dechlorination to occur. Total organic carbon (TOC) can be monitored to qualitatively indicate the presence of a carbon source. However, TOC may contain both bioavailable and non-bioavailable carbon so quantitative interpretation of the TOC is not possible.

Review of the Site's geochemical conditions indicates that the Site is generally aerobic where chlorinated solvents are present in both the near-field and the far-field (Table 5). There are, however, pockets of reducing environments as illustrated by iron-reducing conditions at MW-4 in the near-field and MW-11B and MW 17-3 in the far-field. Also, MW-4 and the three wells in the MW-17 cluster are four of five wells on the Site (MW-5B is the other location) where the primary and secondary sequential reductive daughter products of 1,1,1-TCA, 1,1-DCA and chloroethane, have been detected. Vinyl chloride, the secondary daughter product of TCE and 1,1,1-TCA, was also detected in the October 2006 and April 2007 sampling events in MW-4 and the two residential wells displaying reducing conditions, GAC/RW-21 and GAC/RW-58.

Reducing conditions are not typically expected in areas that are not impacted by contamination; however, the geochemical conditions for the wells on the edge of the far-field contaminant plume indicate generally anaerobic conditions. Table 5 presents the geochemical parameters for a subset of these wells (MW-13B, MW-18-1, -2, and -3, MW-14B, MW-19-1, -2, -3, and MW-10B) that surround the down-gradient portion of the plume from the southwest to the northeast. These wells have negative ORP, DO concentrations less than 1 mg/L, and generally non-detect nitrate, with approximately 50% of the wells having ferrous iron readings above 1 mg/L. This indicates that the general geochemical environment around the contaminant plume is in iron-reducing conditions. These conditions allow reductive dechlorination of TCE to 1,2-DCE and 1,1,1-TCA to 1,1-DCA. This is supported by the data showing low level detections of 1,1-DCE or 1,1-DCA in the wells on the edge of the far-field plume but generally non-detect 1,1,1-TCA and TCE.

It is noted that ethane, the tertiary daughter product of 1,1,1-TCA, and the daughter product of chloroethane has been detected in MW-18-1, northwest of the contaminant plume toward Rondout Creek. It is also noted that chloromethane and methane, the tertiary and quaternary daughter products of carbon tetrachloride, and chloroethane, the secondary daughter product of 1,1,1-TCA, are present in the MW-17 monitoring well cluster located in the northeast portion of the far-field contaminant plume. This suggests pockets of reductive capacity that are allowing complete dechlorination of chlorinated solvents to innocuous daughter products within and outside of the far-field.

Total organic carbon data was also evaluated to determine if there was sufficient organic substrate for reductive dechlorination to occur. The values, generally below 4 mg/L, are relatively low, and indicate some limitation as to the amount of biological activity that

could occur at the Site. However, the presence of the full range of 1,1,1-TCA and carbon tetrachloride daughter products supports the premise that TOC levels are adequate for reductive dechlorination to occur.

B. 1,4-Dioxane

1,4-dioxane is a stabilizer associated with 1,1,1-TCA. The only 1,4-dioxane exceedances of the NYS cleanup level of 50 μg/L have been in the near-field pump-and-treat extraction well, ERT-3, with the values from 1999 through 2007 ranging from 30 to 83 μg/L and in several residential wells, where the 1,4-dioxane concentrations were found to be between 50 and 100 μg/L in initial sampling but presently are below 50 μg/L (USACE 2007, Figure 12).

The affected residential wells have now been disconnected and reconnected to the public water supply. The highest concentration of 1,4-dioxane detected in the far-field monitoring wells has been 18 μg /L at MW-17-1, with non-detect or near non-detect (2 μg/L) concentrations in the far down-gradient wells (Figure 12). The literature information on 1,4-dioxane indicates degradation is unlikely under Site conditions so the decreases in 1,4-dioxane concentrations from the near-field through the far-field are likely due to physical (dilution, dispersion, sorption) processes. With the present far-field concentrations below the NYS cleanup level and the relatively low near-field concentrations, it is likely that the natural attenuation physical processes will continue to contain 1,4-dioxane concentrations in the far-field to below the NYS cleanup level.

IV. SUMMARY and RECOMMENDATIONS

The April 2007 chemical and geochemical data indicate that the Site (both near-field and far-field areas) shows limited but definitive evidence for biological activity supporting reductive dechlorination of 1,1,1-TCA and TCE. The formation of 1,1-DCE from 1,1,1-TCA is more likely associated with an abiotic process, which does not require anaerobic conditions. Although the 1,1-DCE and 1,1-DCA concentration decreases in the far-field plume appear to be primarily related to non-destructive mechanisms (dilution, dispersion, and advection), there is evidence of reductive dechlorination in localized anaerobic areas in both the near- and far-field. These include reducing conditions and the presence of reductive dechlorination daughter products through the secondary 1,1,1-TCA daughter product, chloroethane, and the tertiary and quaternary daughter products, chloromethane and methane, of carbon tetrachloride in the MW-17 monitoring well cluster.

In addition, reducing conditions are present in wells bordering the chlorinated solvent plume from the southwest to the northeast. These conditions are conducive to 1,1,1-TCA and TCE degradation, as evidenced by the general lack of detections of these compounds in the far-field, coupled with low-level detections of 1,1,1-TCA daughter products through the ultimate innocuous daughter product, ethane. It is expected that these

reducing conditions will continue to act to attenuate the concentrations of any chlorinated solvents migrating beyond the present limits of the contaminant plume. In particular, the reducing conditions evidenced in the MW-17 monitoring well cluster to the northeast in the far-field, coupled with non-detect chlorinated solvent concentrations in numerous private wells further to the northeast, support the conclusion that contaminant migration to the private wells beyond the Water District to the northeast not connected to the public water supply, is unlikely.

In summary, as an alternative to a far-field pump-and-treat system, the viability of MNA as a remedy is supported by the following observations:

- Within the Water District, future exposure to contaminated water has been eliminated by replacement of residential water supply wells with a source of public water unaffected by the contaminant plume;
- Decreasing contaminant concentrations in the near-field, with achievement of clean-up goals within a reasonable timeframe;
- Stable and low or non-detectible contaminant concentrations in the far-field;
- Presence of the full range of 1,1,1-TCA and carbon tetrachloride daughter products in the far-field and/or the wells bounding the far-field;
- Presence of reducing conditions bounding the plume in the far-field;
- Migration of contamination beyond the Water District to private wells to the northeast that are not connected to the public water supply is unlikely given the reducing conditions bounding the plume and the non-detect concentrations in wells closer to the plume edges; and
- Significant enhancement of the present MNA processes is expected by the additional source area removal presently being implemented and the increase in extraction rates at the near-field pump-and-treat system.

It is recommended that monitoring continue, with periodic statistical analysis of the data trends, to confirm that the remedy remains protective. If possible, this monitoring should include wells within the Water District to the northeast of the contaminant plume that have shown non-detect concentrations. This will ensure that contaminants are not migrating towards private wells outside the District. This monitoring may be optimized, with consideration of an annual monitoring frequency for wells showing consistent and significant trends and/or complete histories of non-detect contaminant concentrations, and a semi-annual or more frequent monitoring schedule for wells with non-statistically significant trends. A quantitative analysis of the monitoring program, using a tool such as the MAROS software, may also be useful at the Site.

V. REFERENCES

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Figures

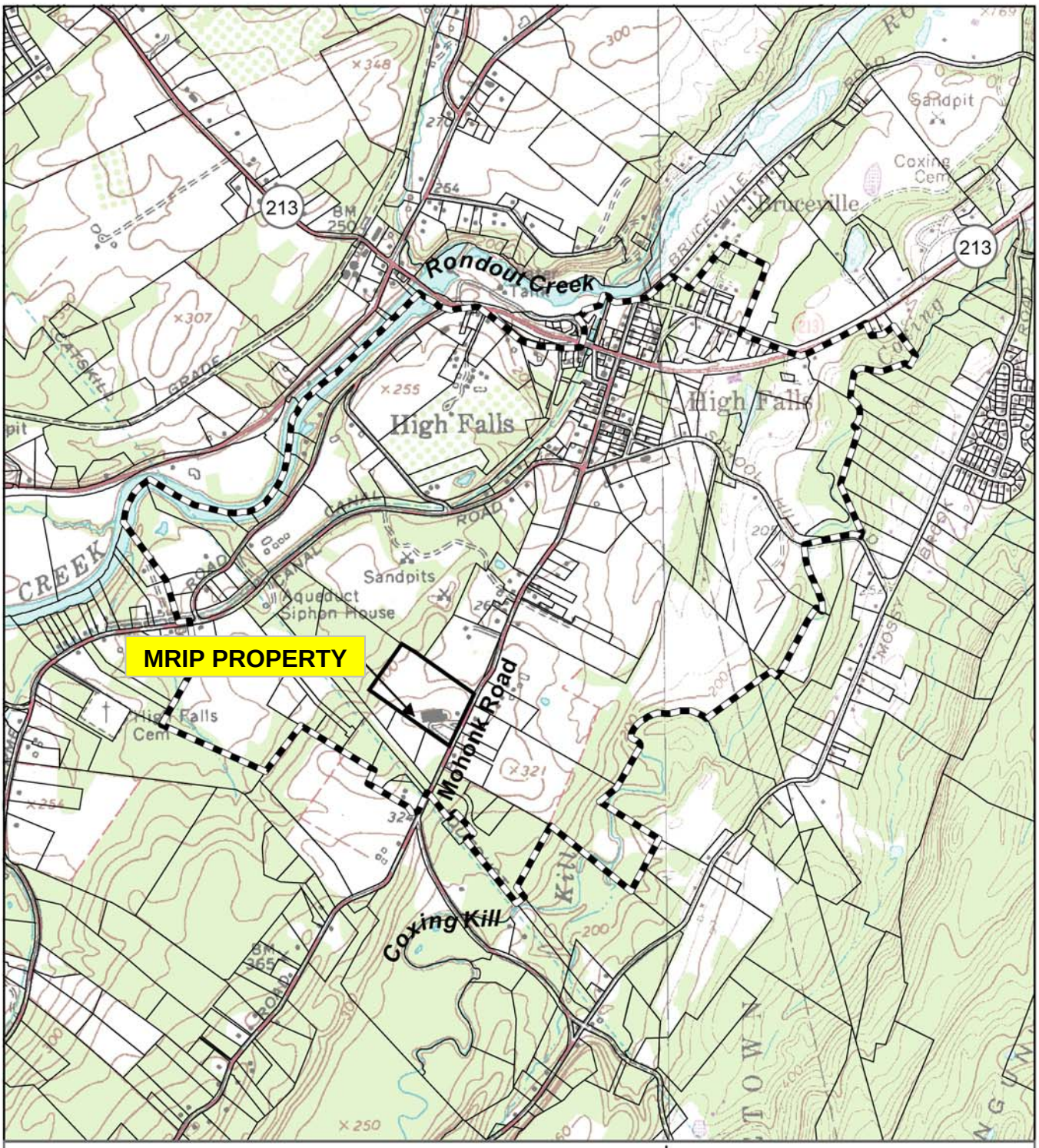


Figure 1

Site Location Map

Mohonk Road Industrial Plant

High Falls, New York

MW20-1
MW20-2
MW20-3
MW-8B
MW19-1
MW19-2
MW19-3
MW-14B
GAC/RW-60
GAC/RW-21
GAC/RW-58
GAC/RW-29
MW-10B
MW-9B
MW-9
MW18-1
MW18-2
MW18-3
MW17-1
MW17-2
MW17-3
GAC/RW-73
MW-16
MW-12B
MW-15B
MW-13B
GAC/RW-41
MW-11B
MW-11C
ERT-1
ERT-2
MW-5R
MW-5B
ERT-3
MW-4
ERT-4
MW-7R
MW-6B
MW-1B

High Falls
Water Tank
Sandpits
Aqueduct Siphon House
High Falls Cem
CATSKILL GRADE
CANAL ROAD
SCHOOL HILL RD
MOSSY BROOK

0 0.25 0.5 1 Miles

Wells:

- Residential
- Monitoring
- 1,4-Dioxane (50 µg/L)
- 1,1,1-Trichloroethane (5 µg/L)
- Trichloroethene (5 µg/L)
- 1,1-Dichloroethane (5 µg/L)
- 1,1-Dichloroethene (5 µg/L)
- Water District Boundary

NOTES:
-Features placed utilizing aerial photography, historical documents, and field notes. Horizontal accuracy is approximate.
-Isocontours based on data collected in April 2007
-ND = Not Detected (<Quantitation Limit)
-NM = Not Measured
-Coordinate System= NAD83 UTM Zone 18N

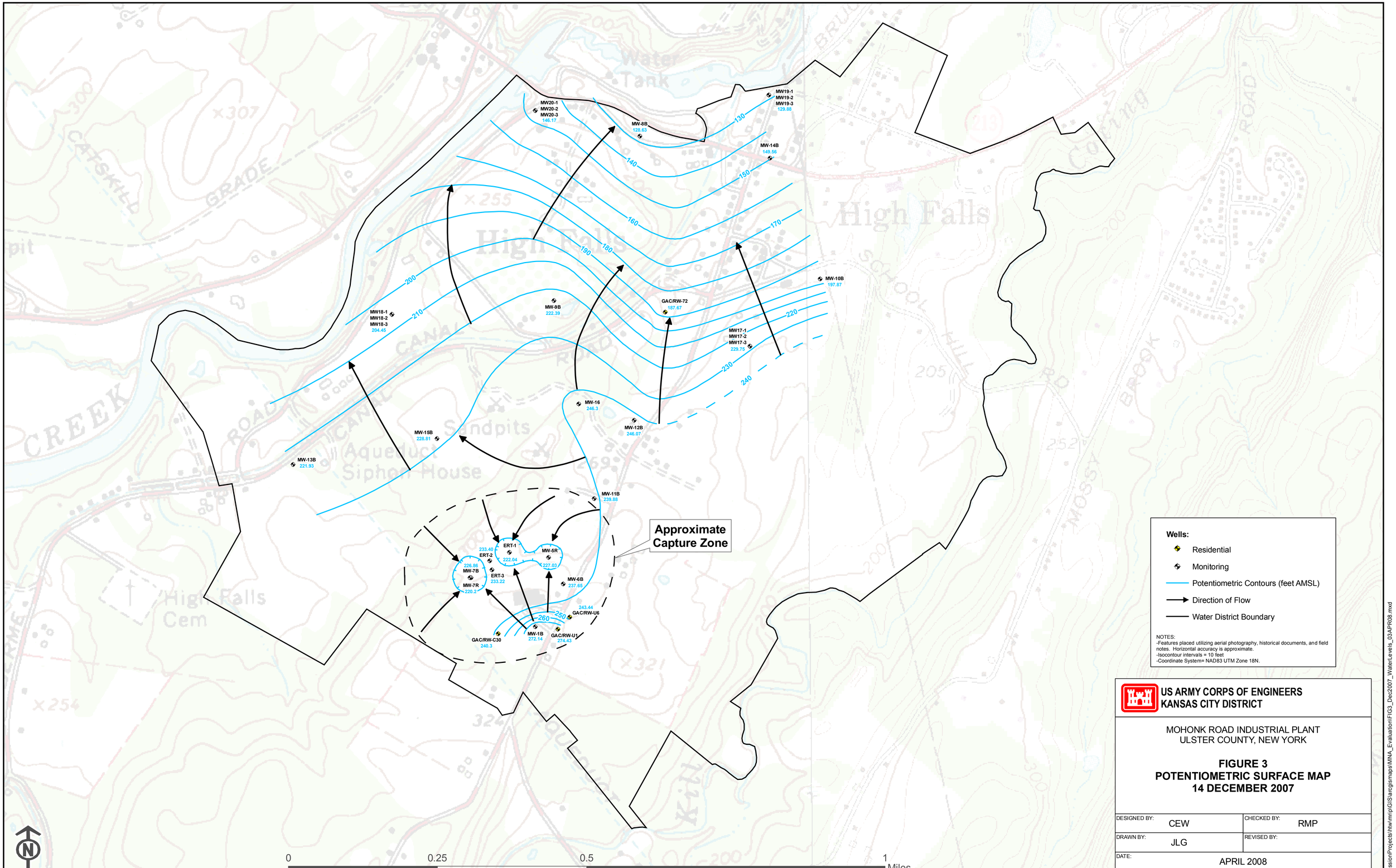
US ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

MOHONK ROAD INDUSTRIAL PLANT
ULSTER COUNTY, NEW YORK

FIGURE 2
AREA MAP SHOWING CONTAMINANTS IN GROUNDWATER

DESIGNED BY: ASG	CHECKED BY: RMP
DRAWN BY: JLG	REVISED BY:
DATE: APRIL 2008	

K:\MissionProjects\htw\mrip\GIS\arcgismaps\MNA_Evaluation\FIG2_GWCONT_ANSID_02APR08.mxd



Wells:

- Residential
- Monitoring
- Potentiometric Contours (feet AMSL)
- Direction of Flow
- Water District Boundary

NOTES:
-Features placed utilizing aerial photography, historical documents, and field notes. Horizontal accuracy is approximate.
-Isocontour intervals = 10 feet
-Coordinate System= NAD83 UTM Zone 18N.

US ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

MOHONK ROAD INDUSTRIAL PLANT
ULSTER COUNTY, NEW YORK

FIGURE 3
POTENTIOMETRIC SURFACE MAP
14 DECEMBER 2007

DESIGNED BY: CEW	CHECKED BY: RMP
DRAWN BY: JLG	REVISED BY:
DATE: APRIL 2008	

K:\MissionProjects\htwmrip\GIS\arcgismaps\MNA_Evaluation\FIG3_Dec2007_WaterLevels_03APR08.mxd

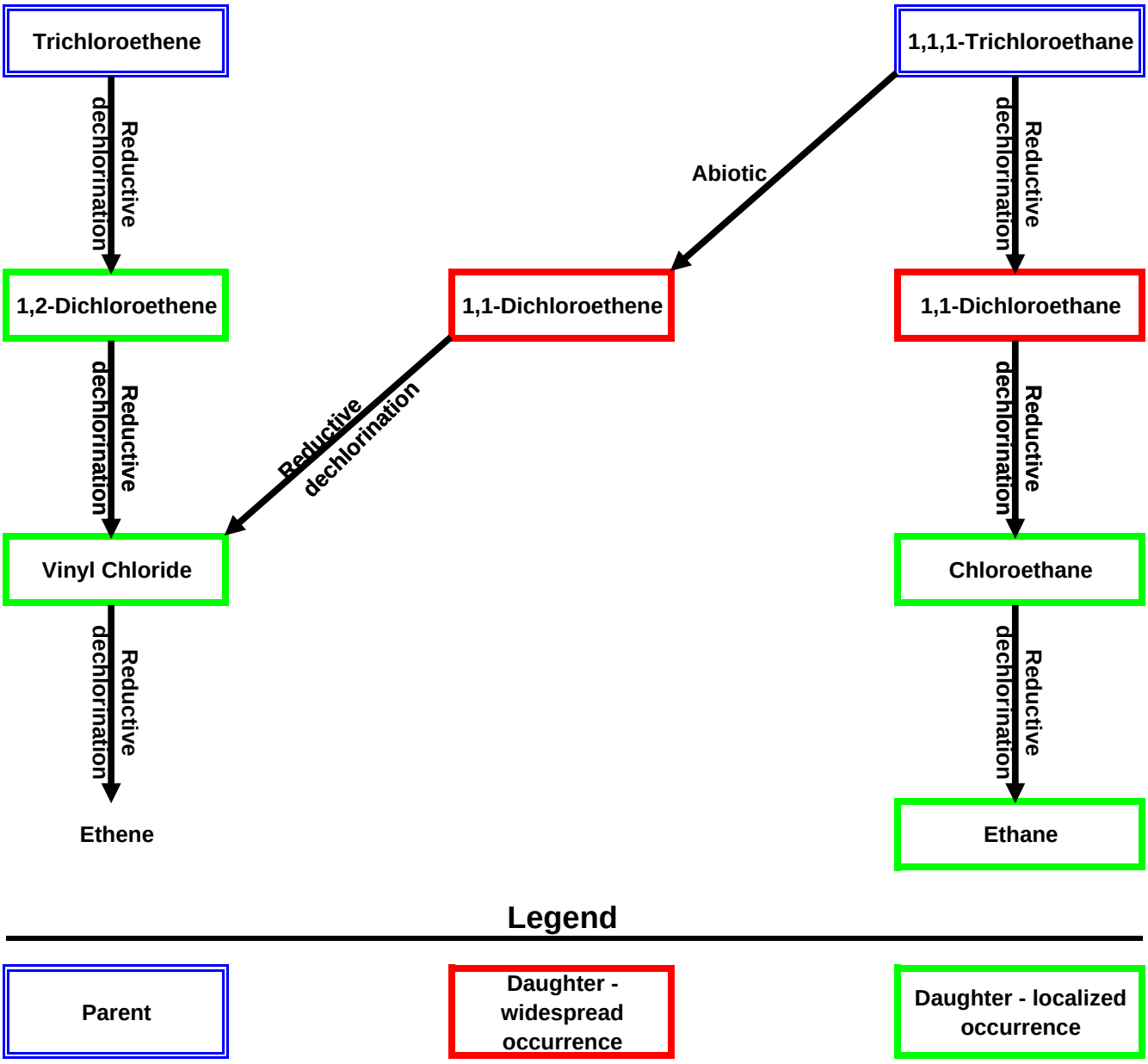
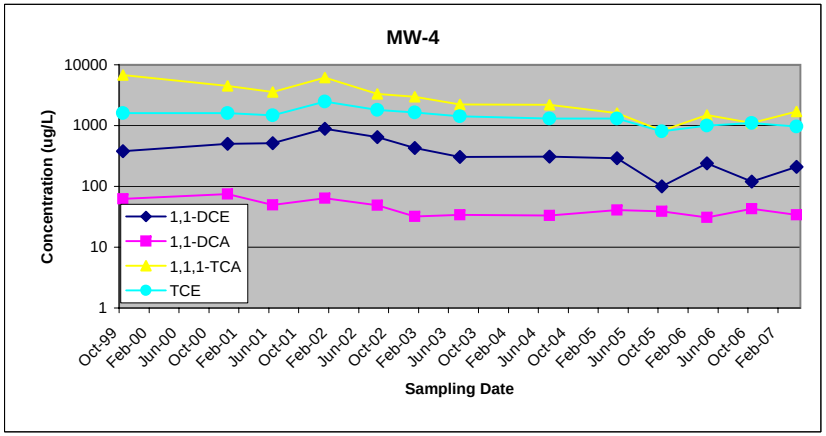
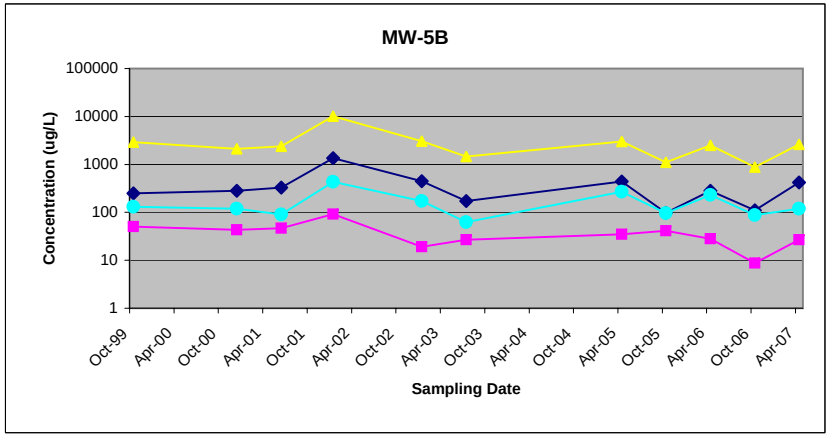
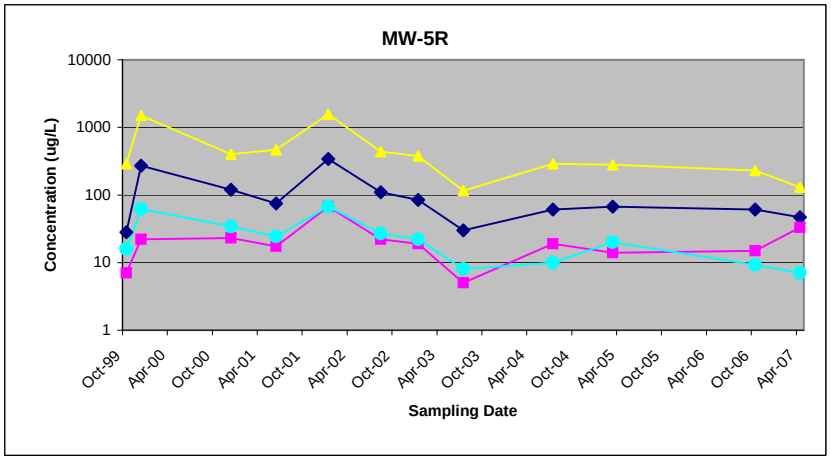


Figure 4. Degradation Pathways at Mohonk

Mohonk Road Industrial Plant Site
Historical Summary of Groundwater Analytical Results
Monitoring Well Sampling Events







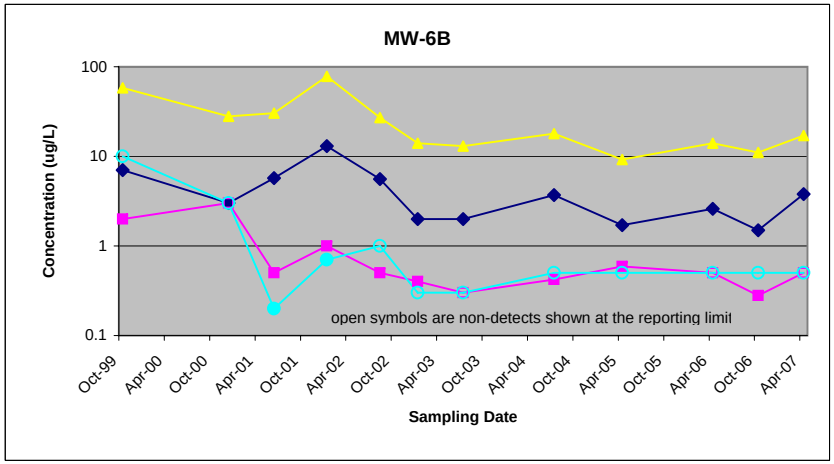
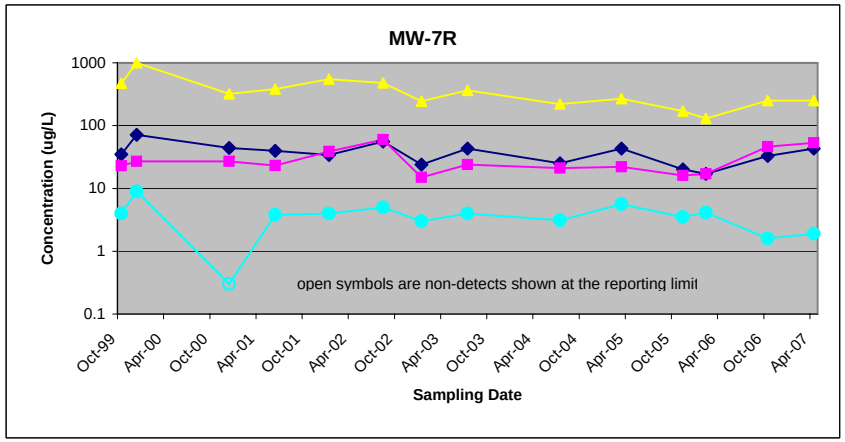
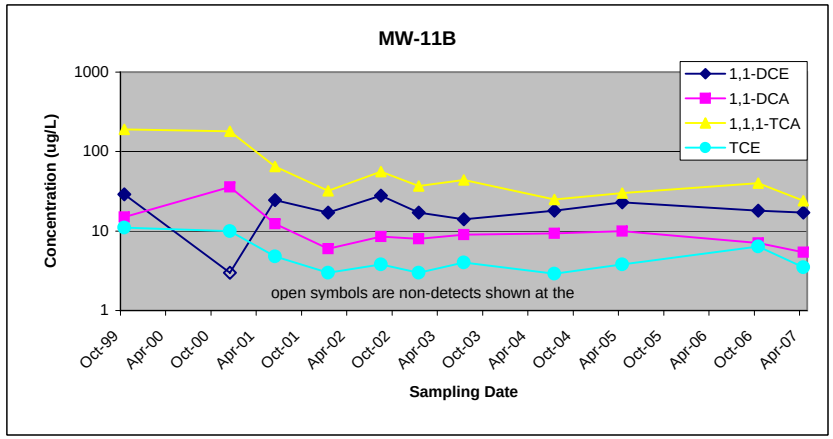
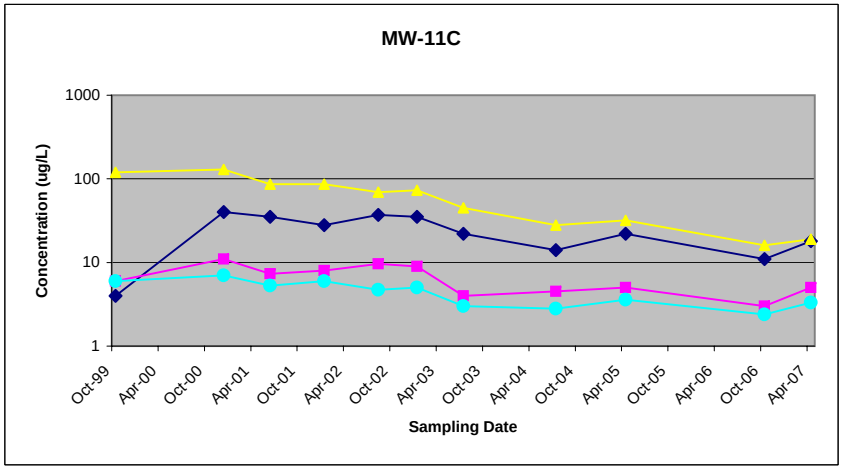


Figure 5

Mohonk Road Industrial Plant Site
Historical Summary of Groundwater Analytical Results
Monitoring Well Sampling Events







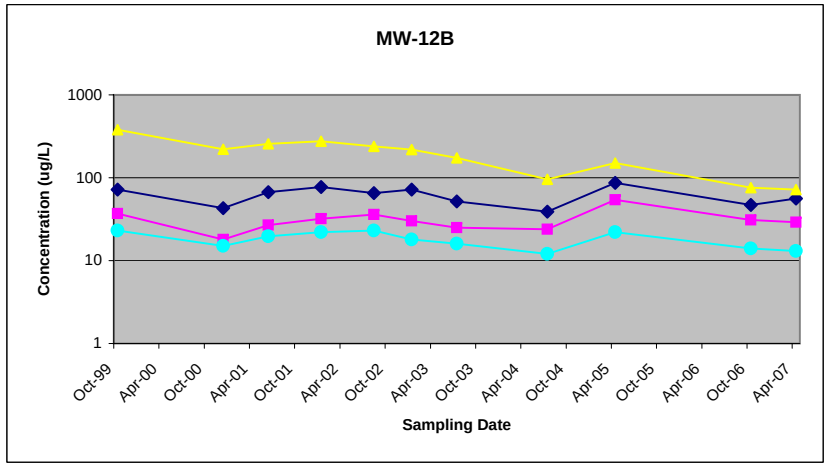
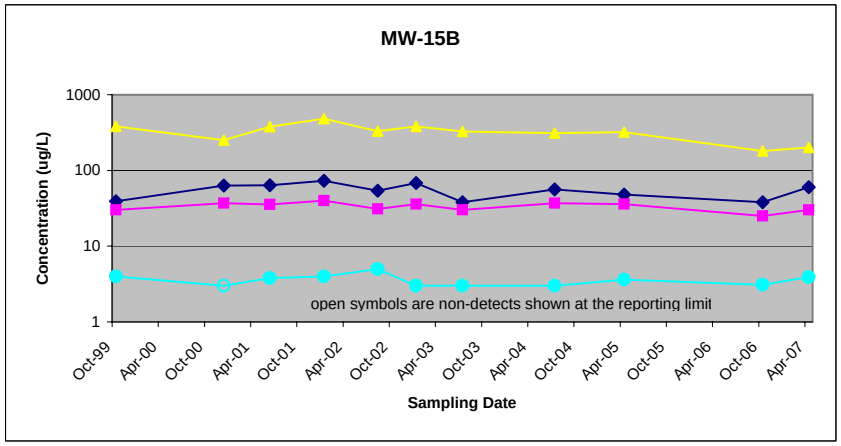
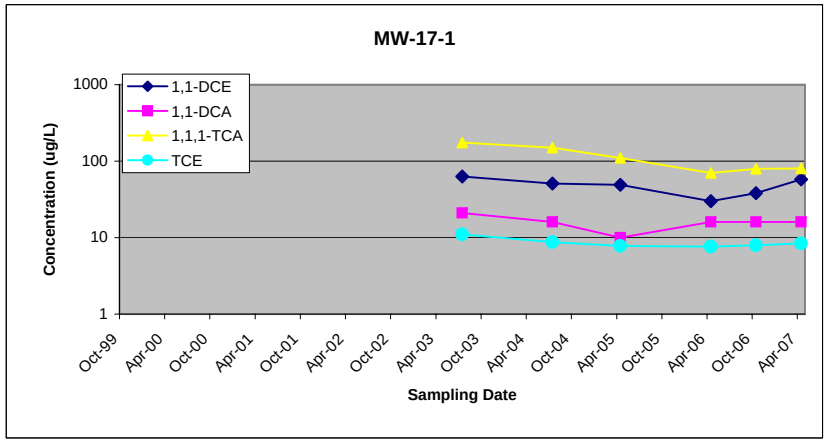
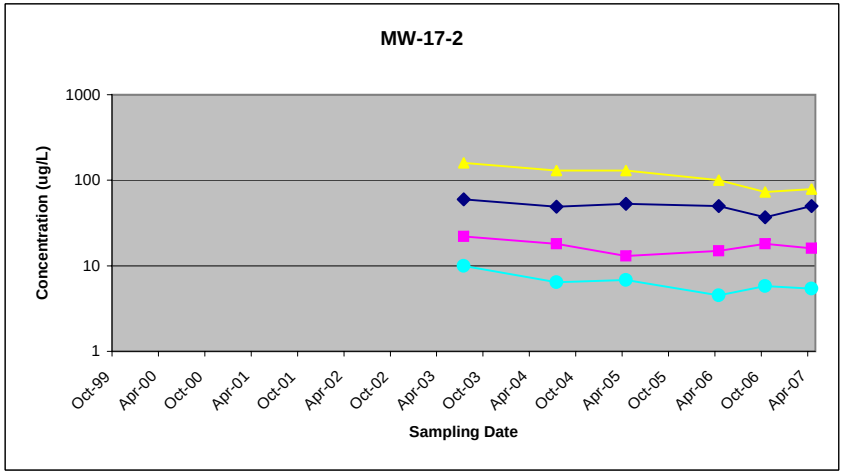


Figure 5

Mohonk Road Industrial Plant Site
Historical Summary of Groundwater Analytical Results
Monitoring Well Sampling Events







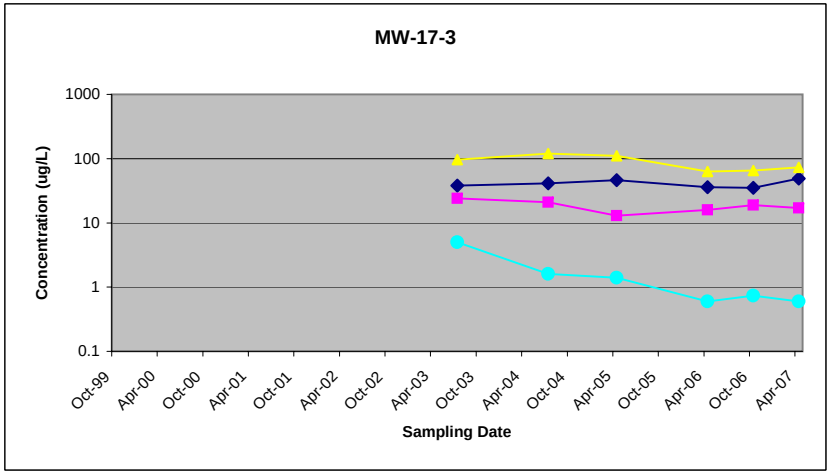
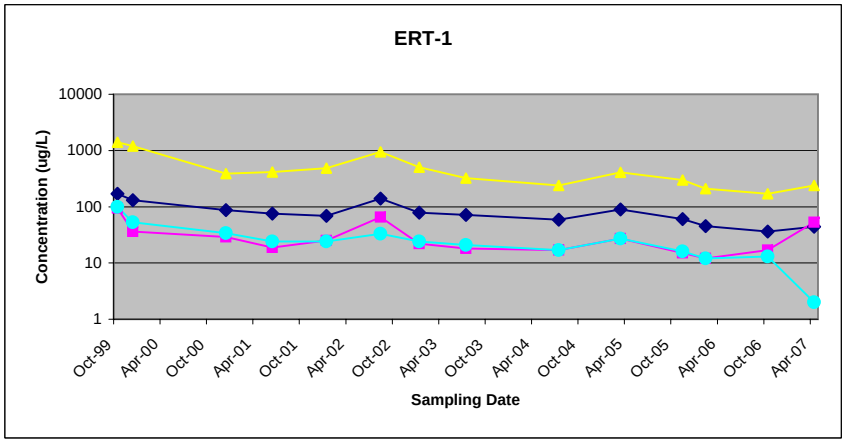
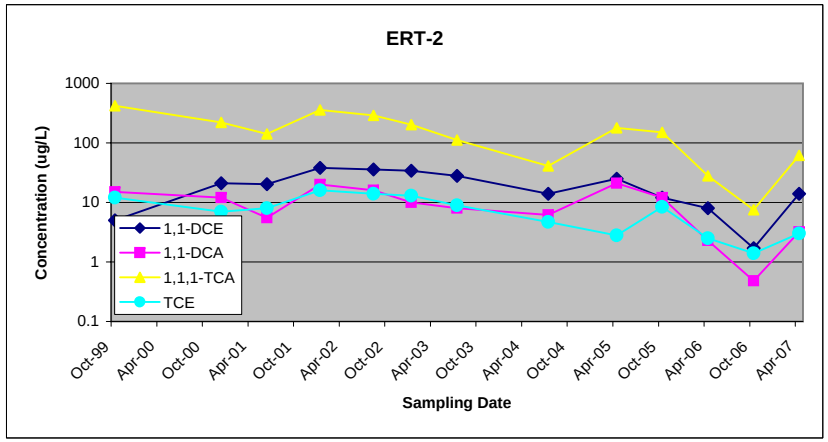
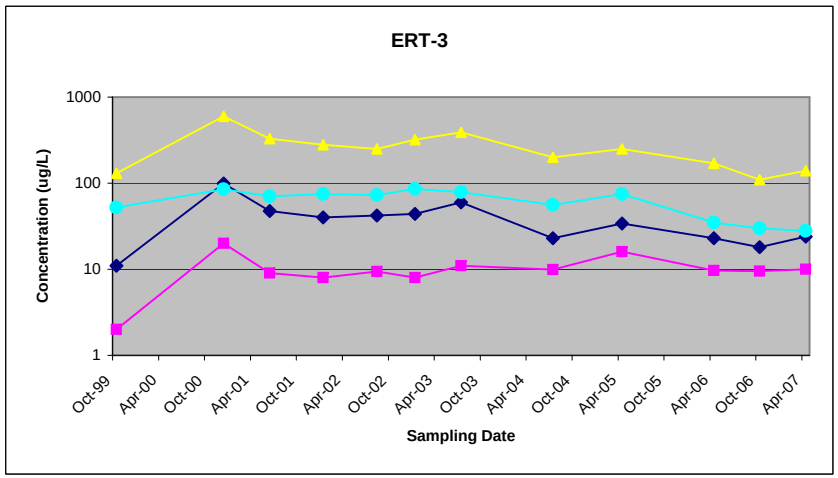


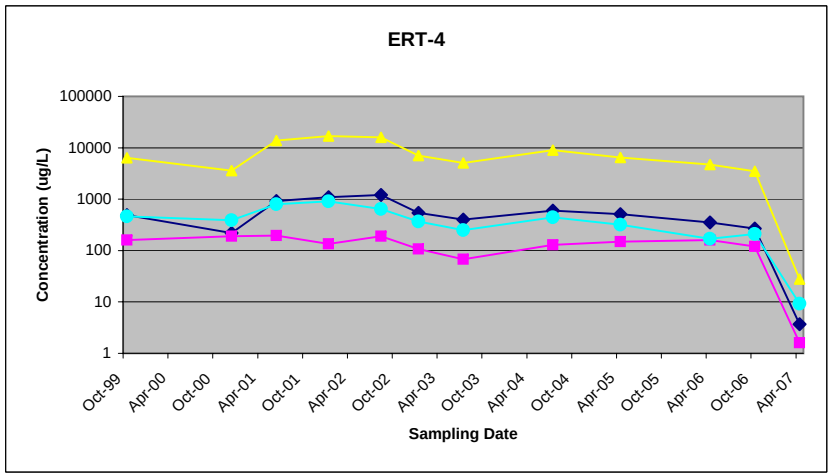
Figure 5

Mohonk Road Industrial Plant Site
Historical Summary of Groundwater Analytical Results
Monitoring Well Sampling Events









Mohonk Road Industrial Plant Site
Historical Summary of Groundwater Analytical Results
Monitoring Well Sampling Results

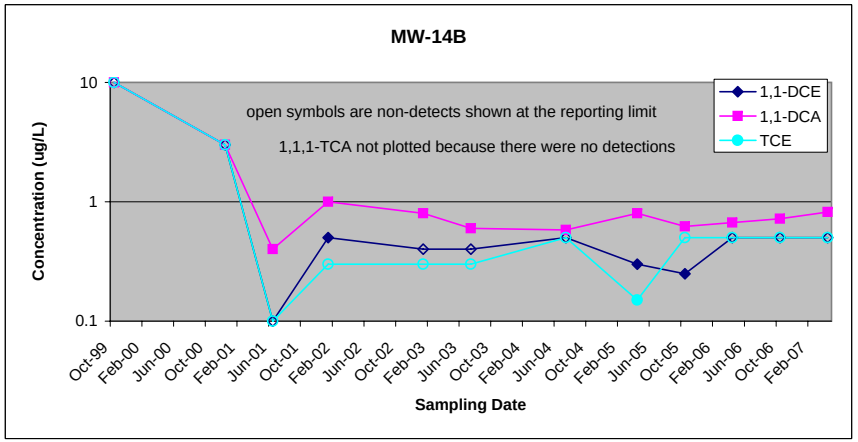


Figure 5

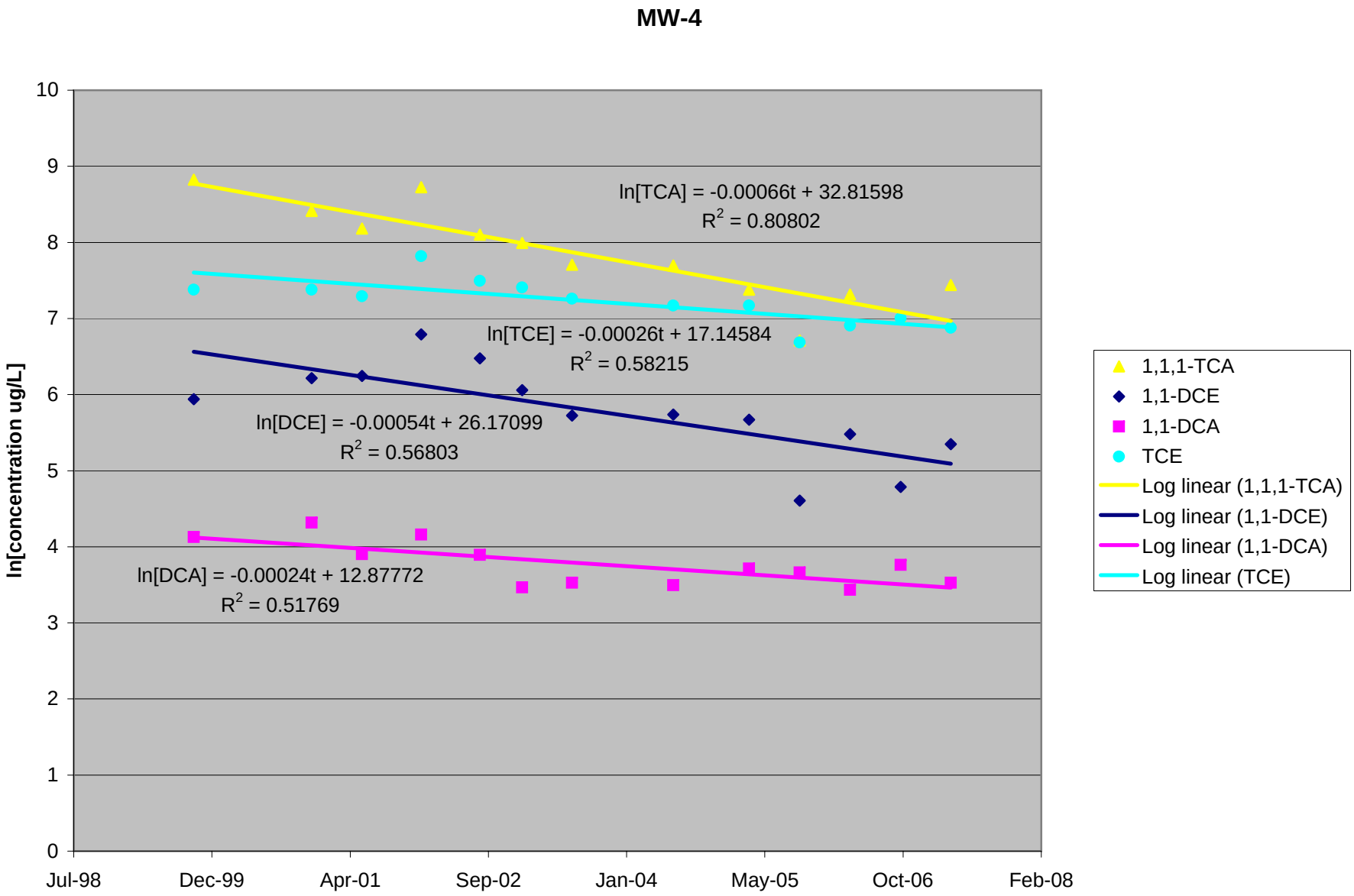
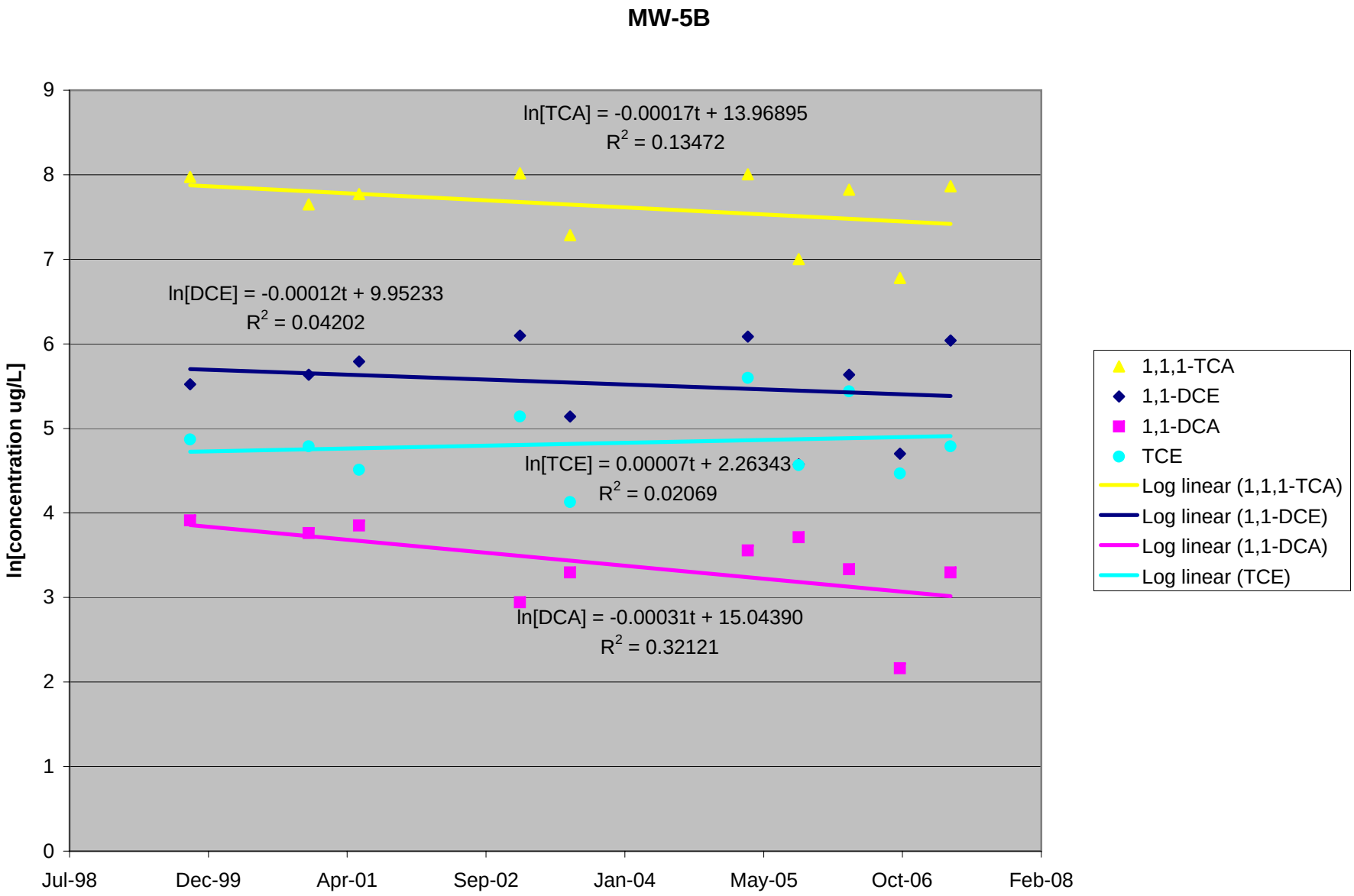


Figure 6
Page 1 of 16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R2 = 0.13472
ln[DCE] = -0.00012t + 9.95233
R2 = 0.04202
ln[TCE] = 0.00007t + 2.26343
R2 = 0.02069
ln[DCA] = -0.00031t + 15.04390
R2 = 0.32121
ln[concentration ug/L]
0
1
2
3
4
5
6
7
8
9
Jul-98
Dec-99
Apr-01
Sep-02
Jan-04
May-05
Oct-06
Feb-08
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCE)
Log linear (1,1-DCA)
Log linear (TCE)

Figure 6

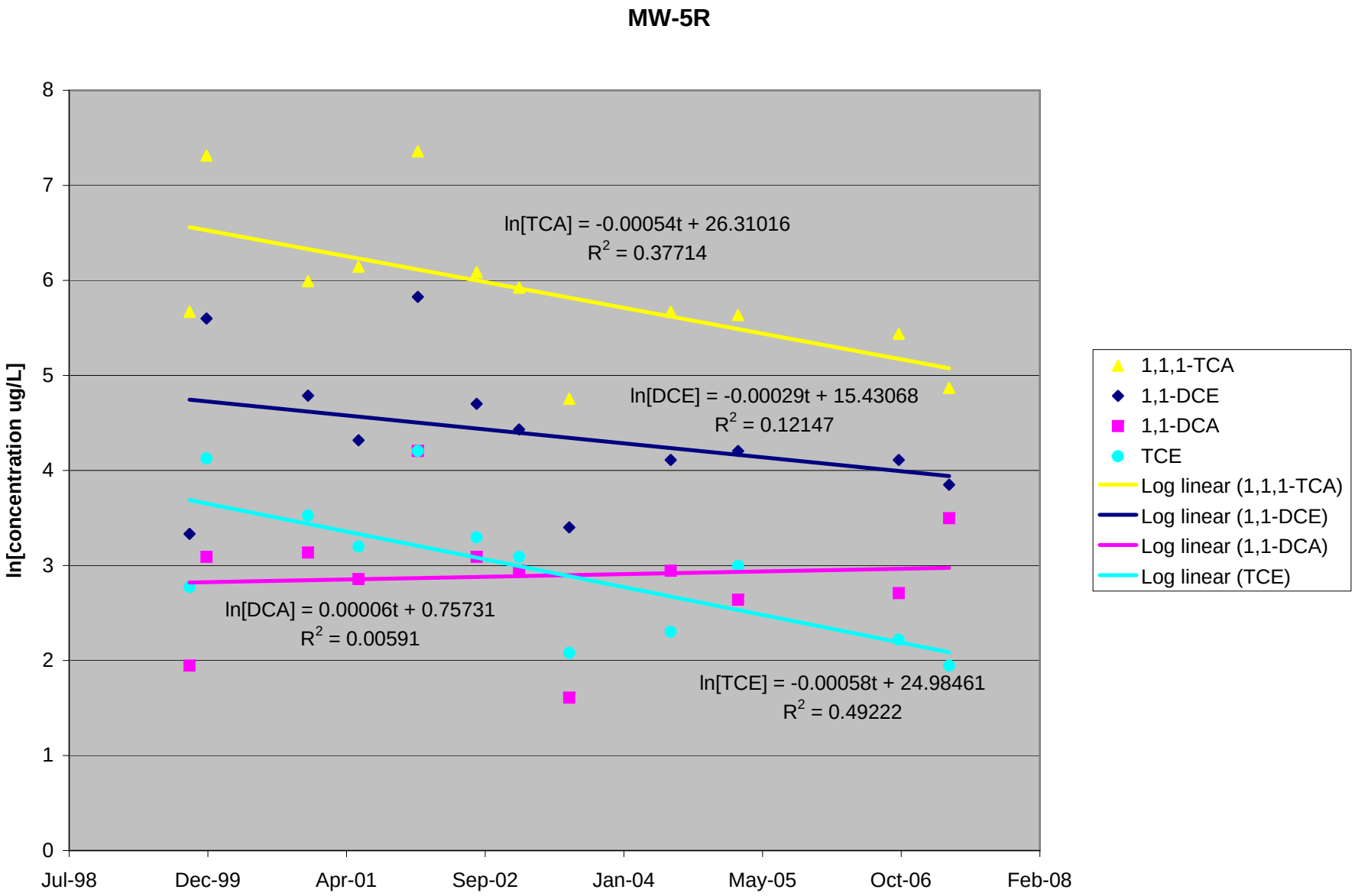

MW-5R
ln[concentration ug/L]
8
7
6
5
4
3
2
1
0
Jul-98
Dec-99
Apr-01
Sep-02
Jan-04
May-05
Oct-06
Feb-08
ln[TCA] = -0.00054t + 26.31016
R2 = 0.37714
ln[DCE] = -0.00029t + 15.43068
R2 = 0.12147
ln[DCA] = 0.00006t + 0.75731
R2 = 0.00591
ln[TCE] = -0.00058t + 24.98461
R2 = 0.49222
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCE)
Log linear (1,1-DCA)
Log linear (TCE)

Figure 6

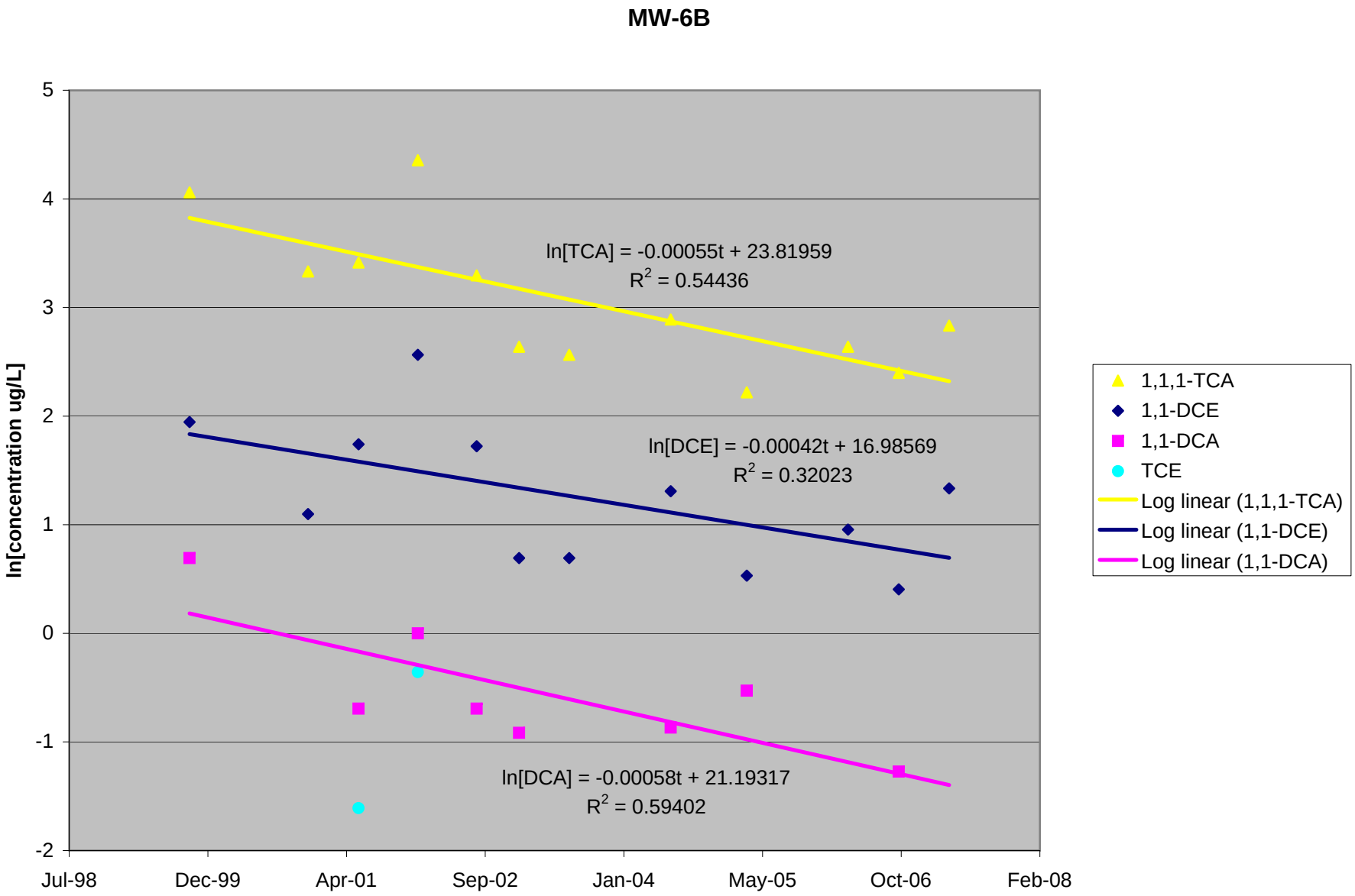

MW-6B
ln[concentration ug/L]
5
4
3
2
1
0
-1
-2
Jul-98
Dec-99
Apr-01
Sep-02
Jan-04
May-05
Oct-06
Feb-08
ln[TCA] = -0.00055t + 23.81959
R2 = 0.54436
ln[DCE] = -0.00042t + 16.98569
R2 = 0.32023
ln[DCA] = -0.00058t + 21.19317
R2 = 0.59402
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCE)
Log linear (1,1-DCA)

Figure 6

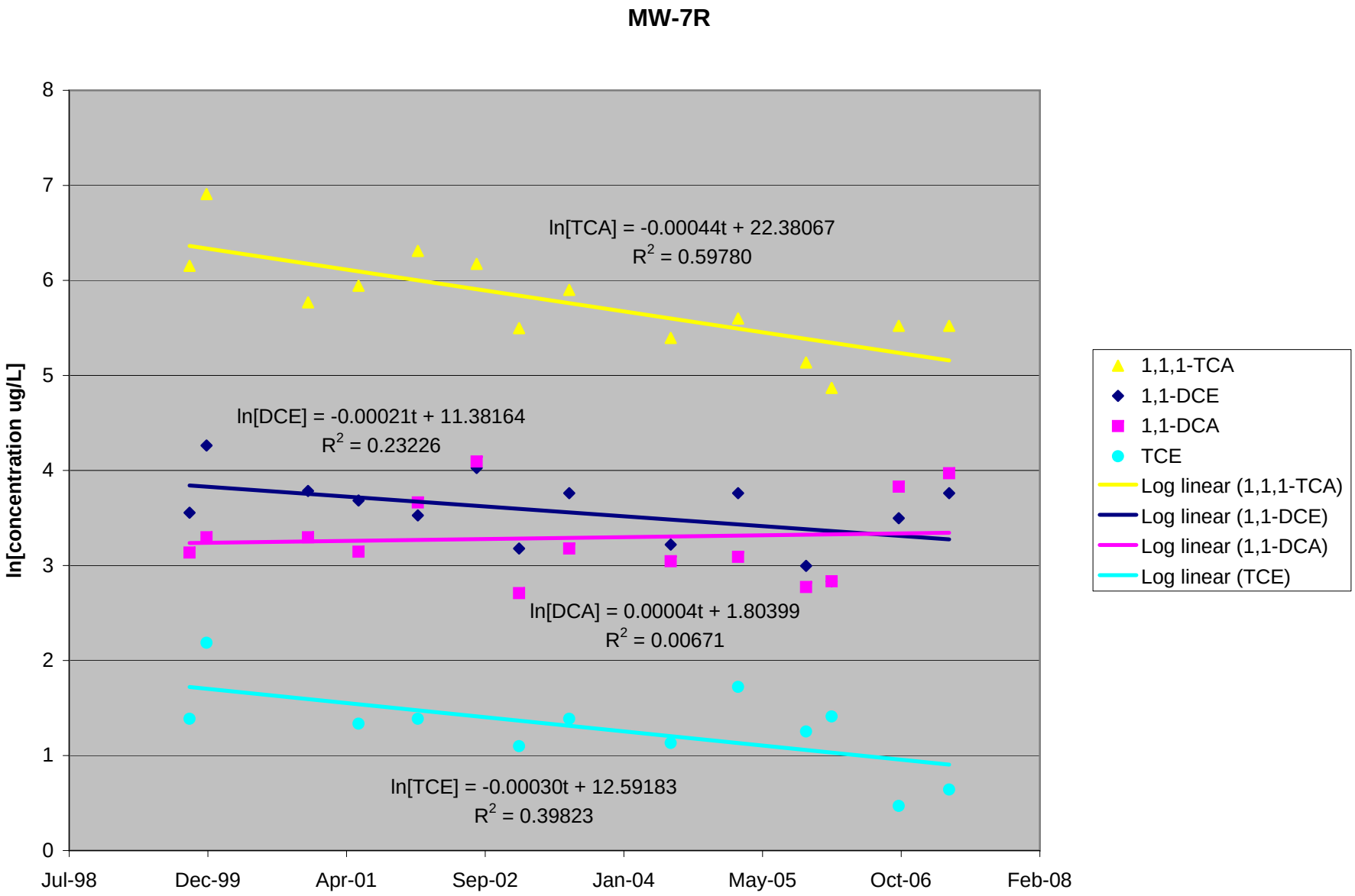
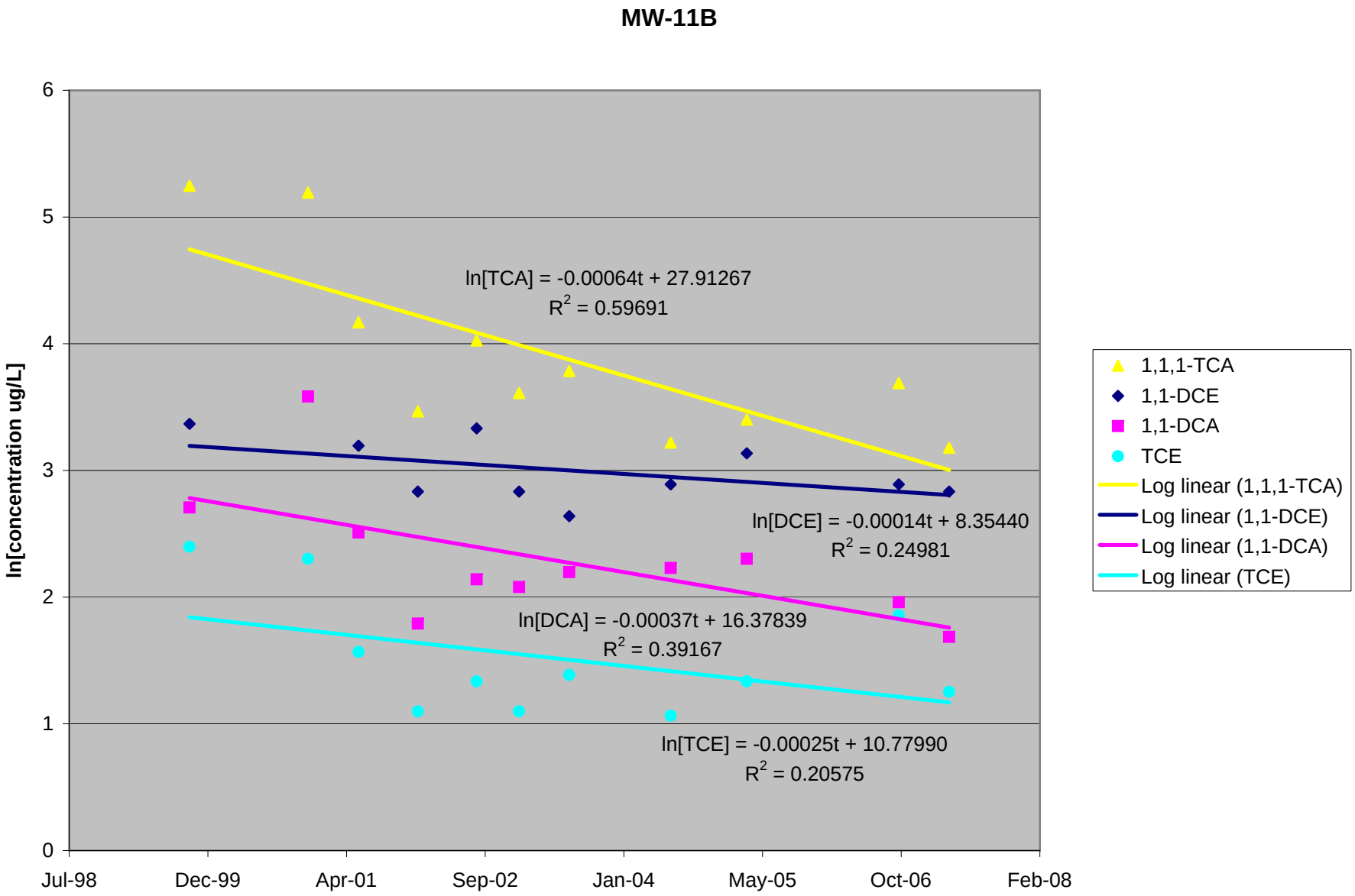

MW-7R
ln[concentration ug/L]
8
7
6
5
4
3
2
1
0
Jul-98
Dec-99
Apr-01
Sep-02
Jan-04
May-05
Oct-06
Feb-08
ln[TCA] = -0.00044t + 22.38067
R2 = 0.59780
ln[DCE] = -0.00021t + 11.38164
R2 = 0.23226
ln[DCA] = 0.00004t + 1.80399
R2 = 0.00671
ln[TCE] = -0.00030t + 12.59183
R2 = 0.39823
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCE)
Log linear (1,1-DCA)
Log linear (TCE)

Figure 6


MW-11B
ln[concentration ug/L]
6
5
4
3
2
1
0
Jul-98
Dec-99
Apr-01
Sep-02
Jan-04
May-05
Oct-06
Feb-08
ln[TCA] = -0.00064t + 27.91267
R2 = 0.59691
ln[DCE] = -0.00014t + 8.35440
R2 = 0.24981
ln[DCA] = -0.00037t + 16.37839
R2 = 0.39167
ln[TCE] = -0.00025t + 10.77990
R2 = 0.20575
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCE)
Log linear (1,1-DCA)
Log linear (TCE)

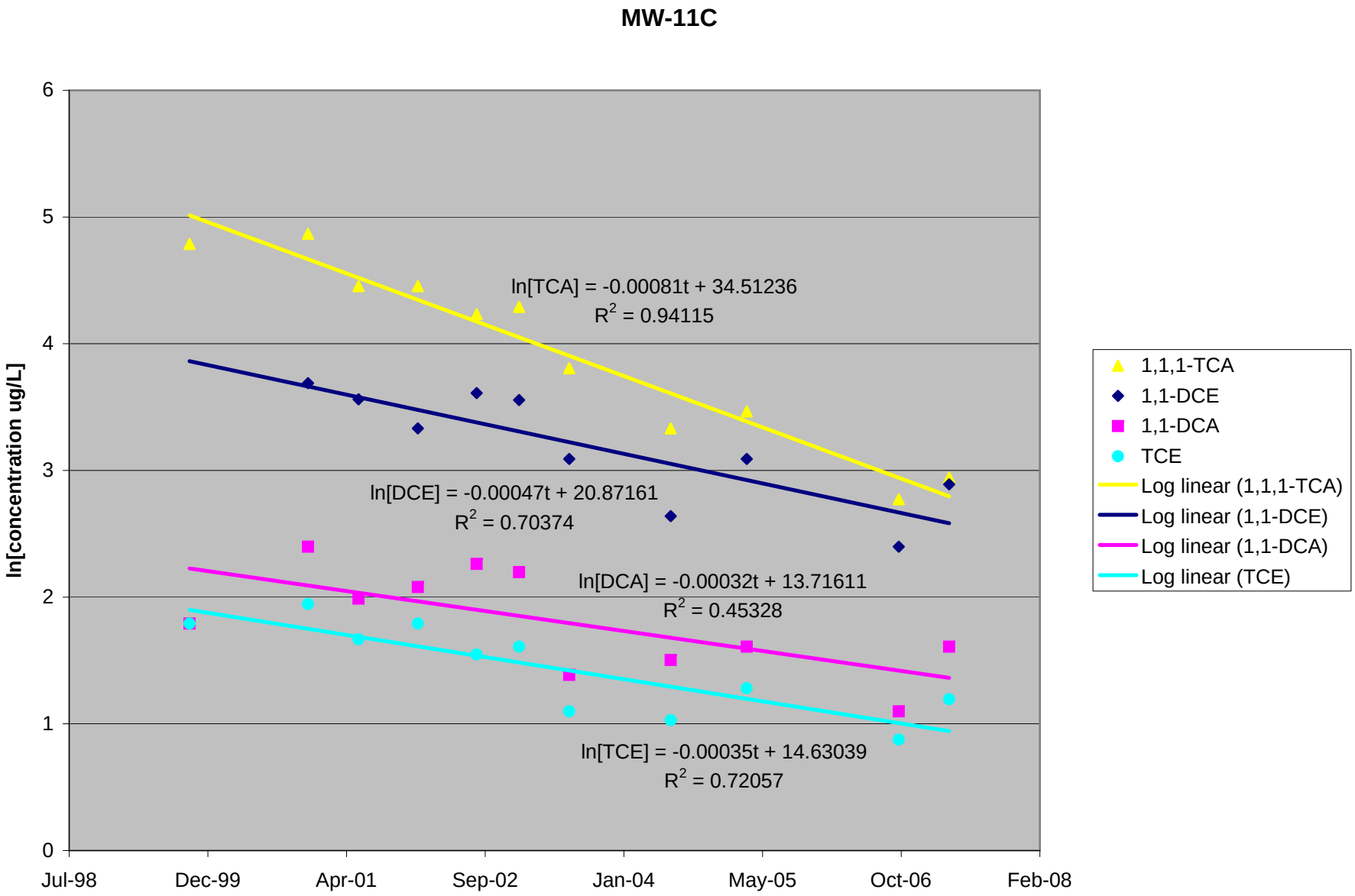

MW-11C
ln[concentration ug/L]
6
5
4
3
2
1
0
Jul-98
Dec-99
Apr-01
Sep-02
Jan-04
May-05
Oct-06
Feb-08
ln[TCA] = -0.00081t + 34.51236
R2 = 0.94115
ln[DCE] = -0.00047t + 20.87161
R2 = 0.70374
ln[DCA] = -0.00032t + 13.71611
R2 = 0.45328
ln[TCE] = -0.00035t + 14.63039
R2 = 0.72057
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCE)
Log linear (1,1-DCA)
Log linear (TCE)

Figure 6

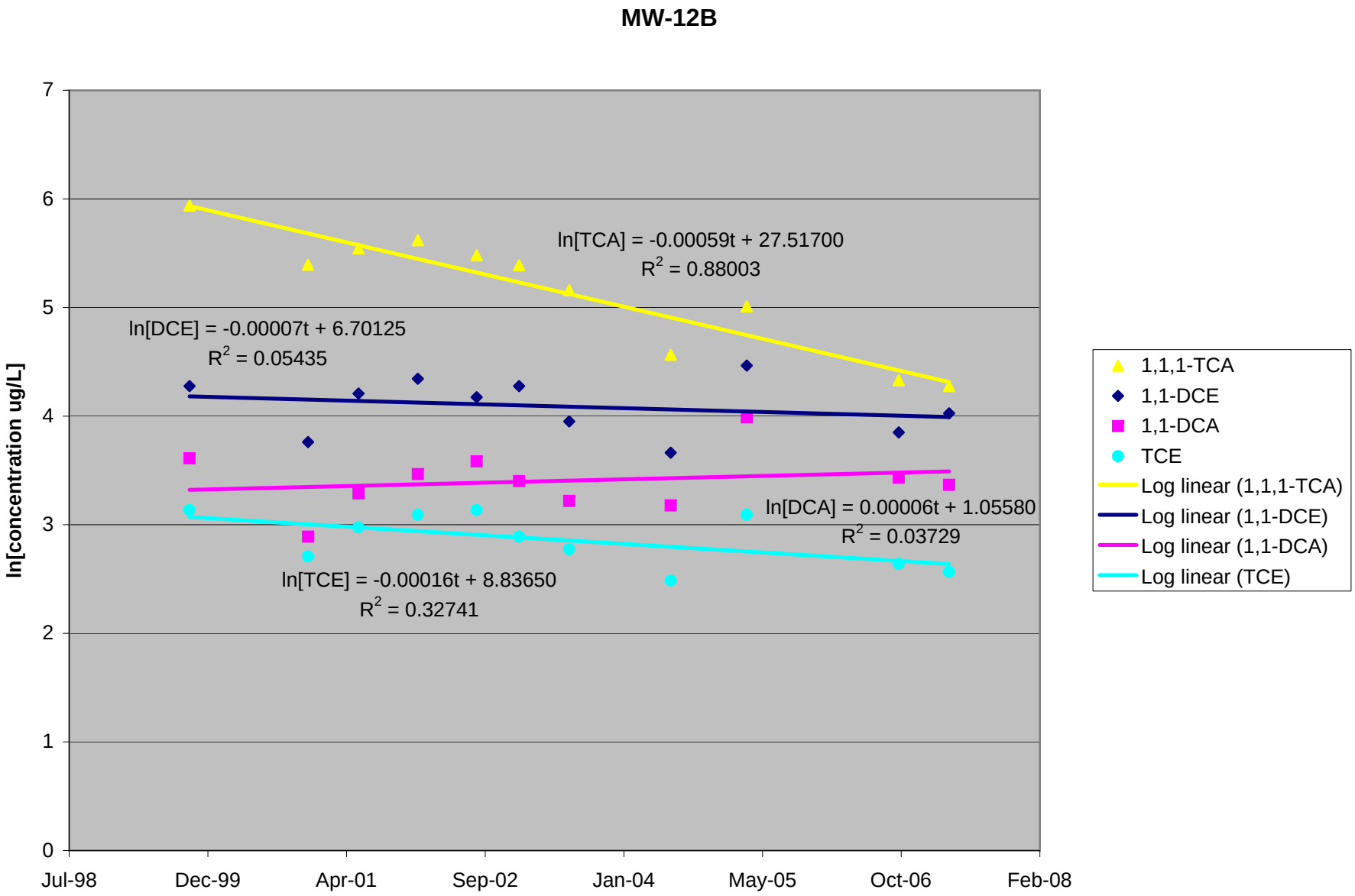

MW-12B
ln[concentration ug/L]
7
6
5
4
3
2
1
0
Jul-98
Dec-99
Apr-01
Sep-02
Jan-04
May-05
Oct-06
Feb-08
ln[TCA] = -0.00059t + 27.51700
R2 = 0.88003
ln[DCE] = -0.00007t + 6.70125
R2 = 0.05435
ln[DCA] = 0.00006t + 1.05580
R2 = 0.03729
ln[TCE] = -0.00016t + 8.83650
R2 = 0.32741
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCE)
Log linear (1,1-DCA)
Log linear (TCE)

Figure 6

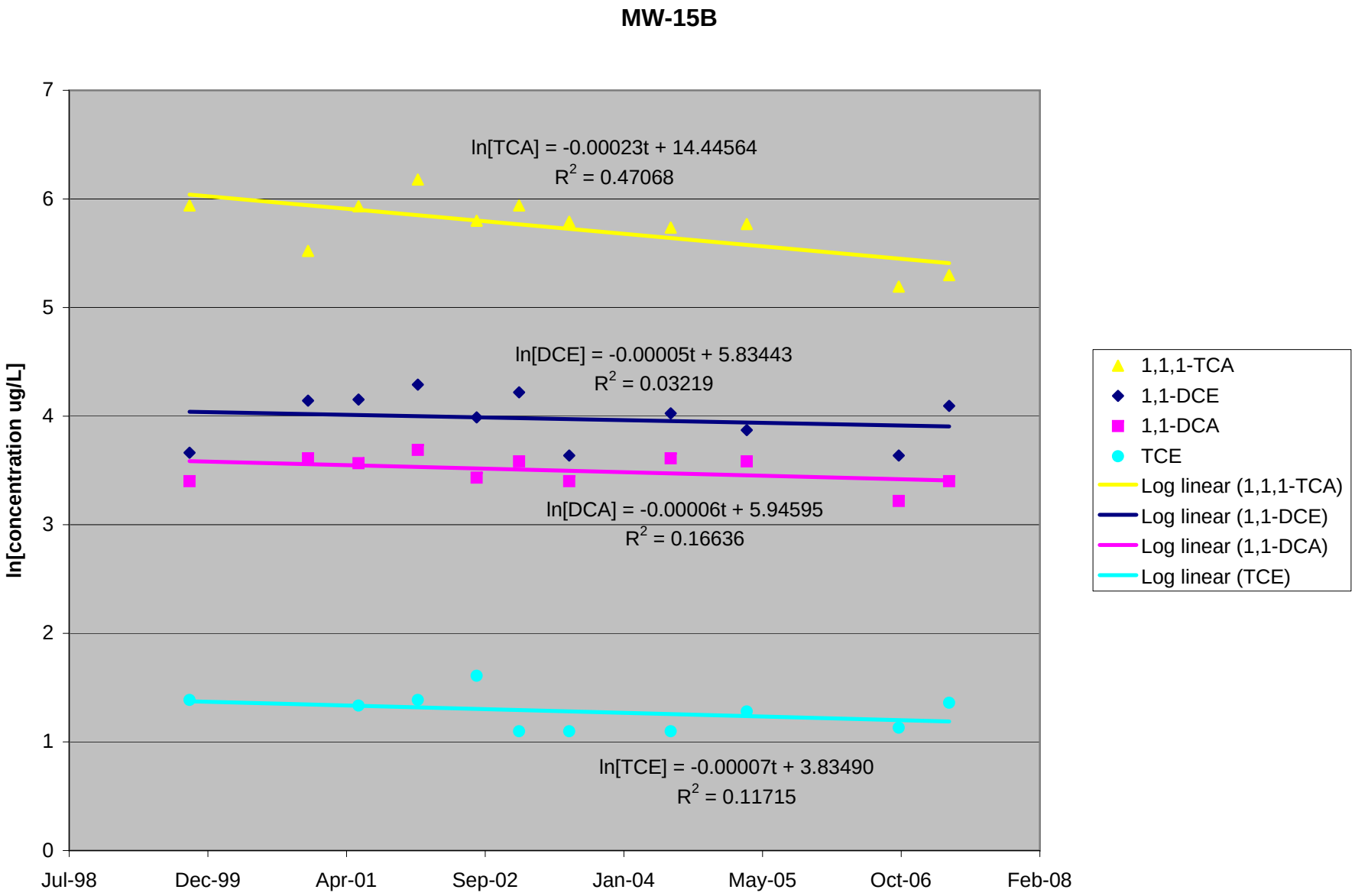

MW-15B
ln[concentration ug/L]
7
6
5
4
3
2
1
0
Jul-98
Dec-99
Apr-01
Sep-02
Jan-04
May-05
Oct-06
Feb-08
ln[TCA] = -0.00023t + 14.44564
R2 = 0.47068
ln[DCE] = -0.00005t + 5.83443
R2 = 0.03219
ln[DCA] = -0.00006t + 5.94595
R2 = 0.16636
ln[TCE] = -0.00007t + 3.83490
R2 = 0.11715
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCE)
Log linear (1,1-DCA)
Log linear (TCE)

Figure 6

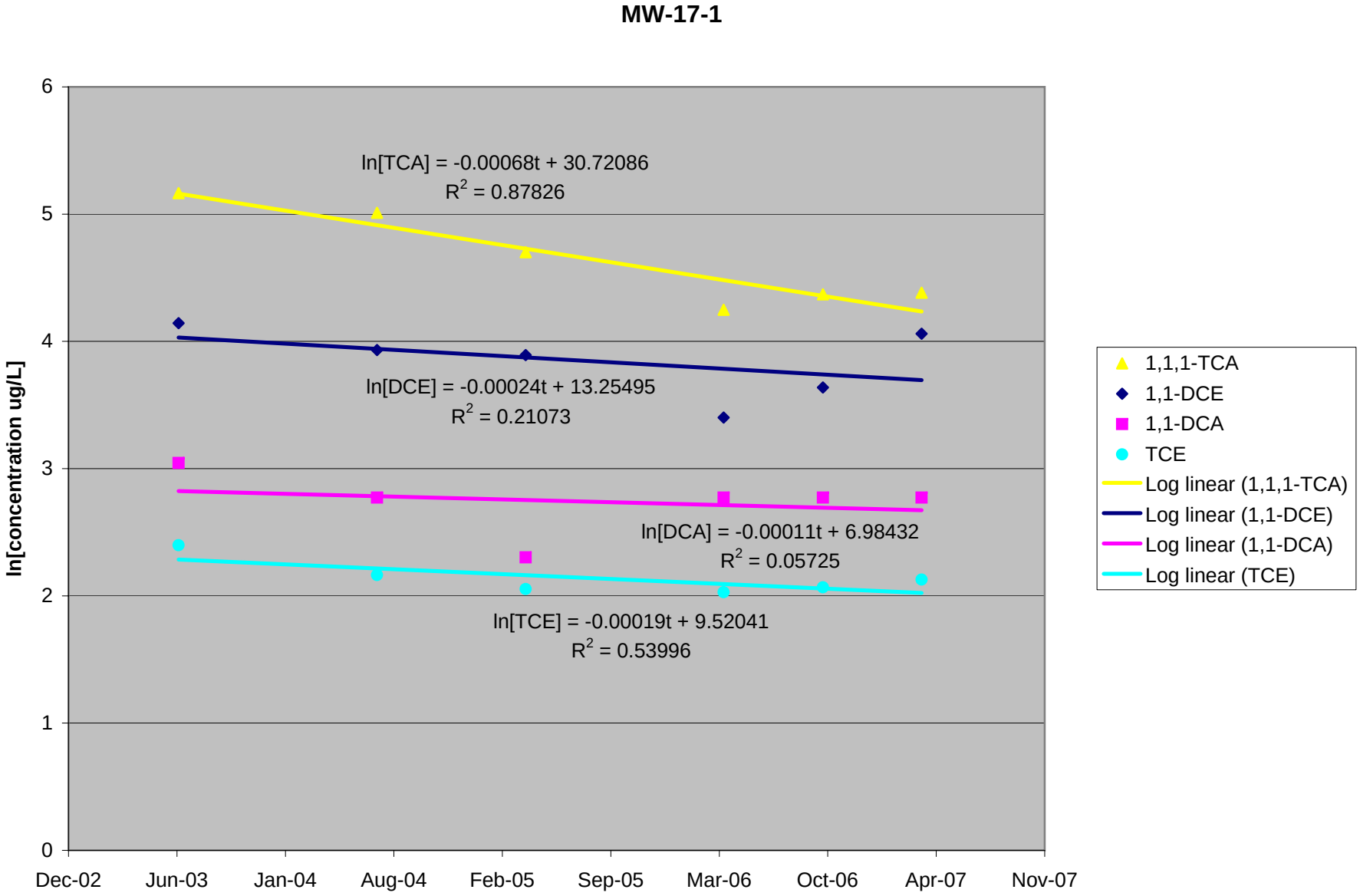

MW-17-1
ln[concentration ug/L]
6
5
4
3
2
1
0
Dec-02
Jun-03
Jan-04
Aug-04
Feb-05
Sep-05
Mar-06
Oct-06
Apr-07
Nov-07
ln[TCA] = -0.00068t + 30.72086
R2 = 0.87826
ln[DCE] = -0.00024t + 13.25495
R2 = 0.21073
ln[DCA] = -0.00011t + 6.98432
R2 = 0.05725
ln[TCE] = -0.00019t + 9.52041
R2 = 0.53996
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCE)
Log linear (1,1-DCA)
Log linear (TCE)

Figure 6

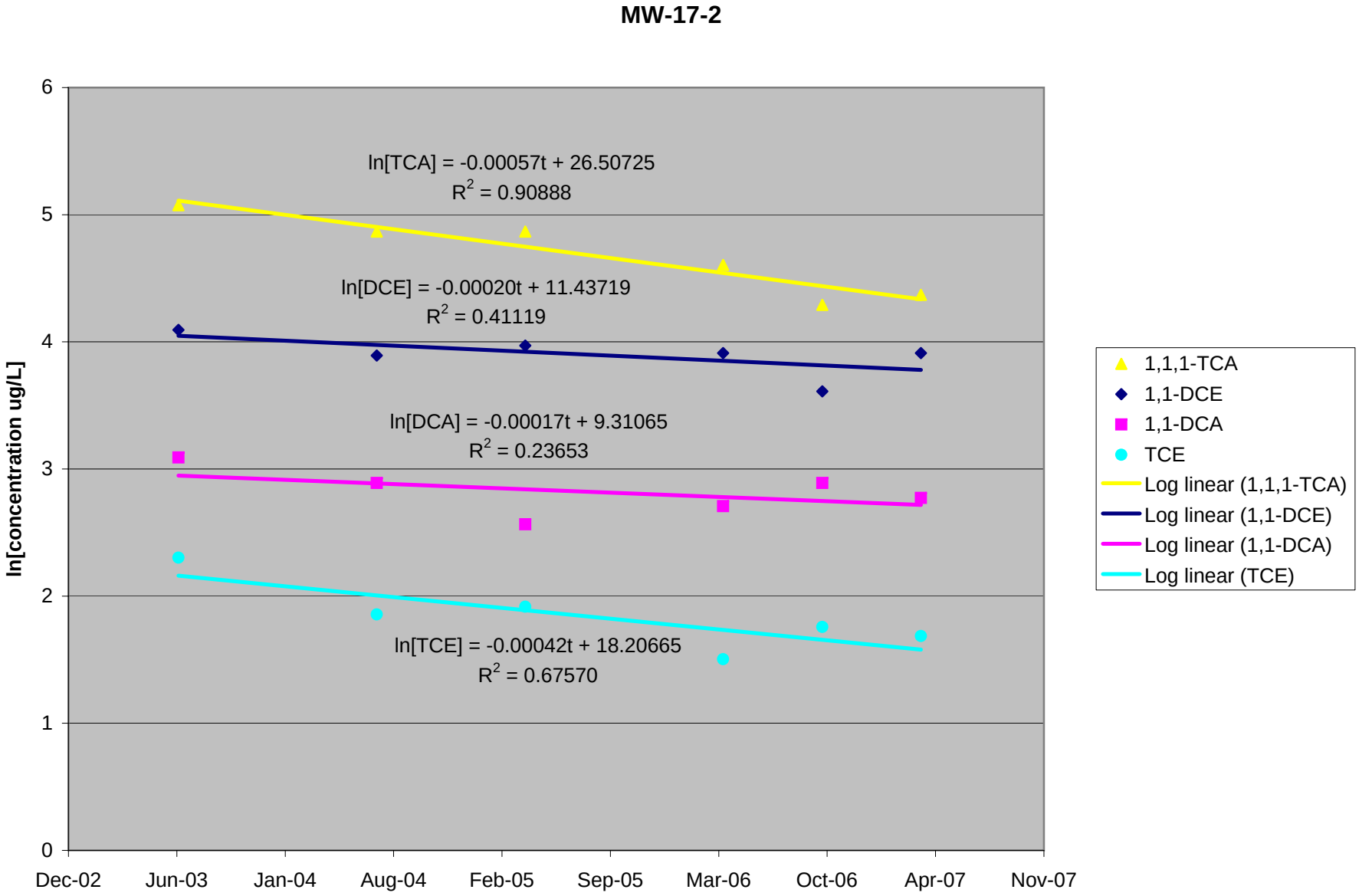

MW-17-2
ln[concentration ug/L]
6
5
4
3
2
1
0
Dec-02
Jun-03
Jan-04
Aug-04
Feb-05
Sep-05
Mar-06
Oct-06
Apr-07
Nov-07
ln[TCA] = -0.00057t + 26.50725
R2 = 0.90888
ln[DCE] = -0.00020t + 11.43719
R2 = 0.41119
ln[DCA] = -0.00017t + 9.31065
R2 = 0.23653
ln[TCE] = -0.00042t + 18.20665
R2 = 0.67570
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCE)
Log linear (1,1-DCA)
Log linear (TCE)

Figure 6

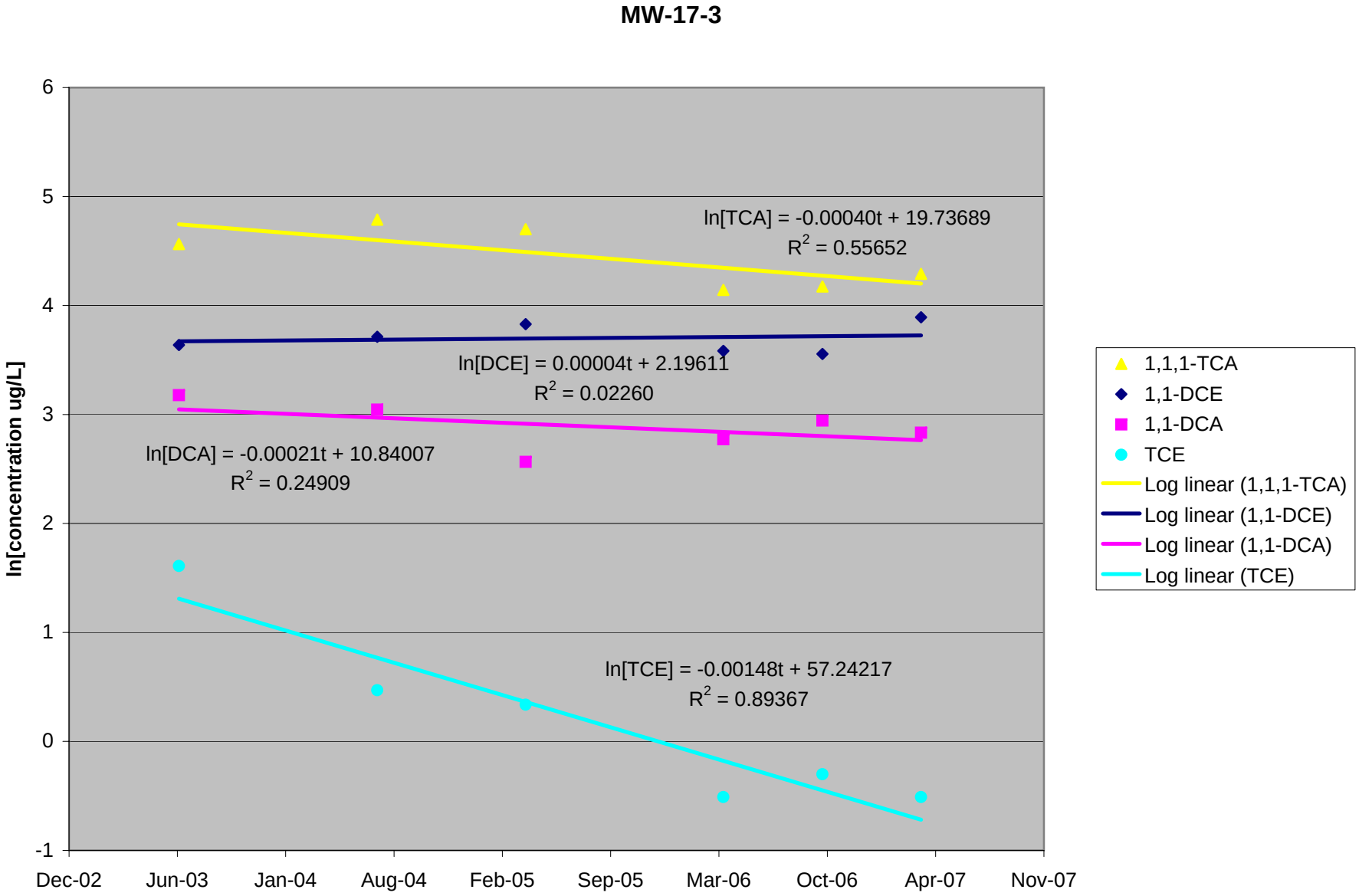

MW-17-3
ln[concentration ug/L]
6
5
4
3
2
1
0
-1
Dec-02
Jun-03
Jan-04
Aug-04
Feb-05
Sep-05
Mar-06
Oct-06
Apr-07
Nov-07
ln[TCA] = -0.00040t + 19.73689
R2 = 0.55652
ln[DCE] = 0.00004t + 2.19611
R2 = 0.02260
ln[DCA] = -0.00021t + 10.84007
R2 = 0.24909
ln[TCE] = -0.00148t + 57.24217
R2 = 0.89367
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCE)
Log linear (1,1-DCA)
Log linear (TCE)

Figure 6

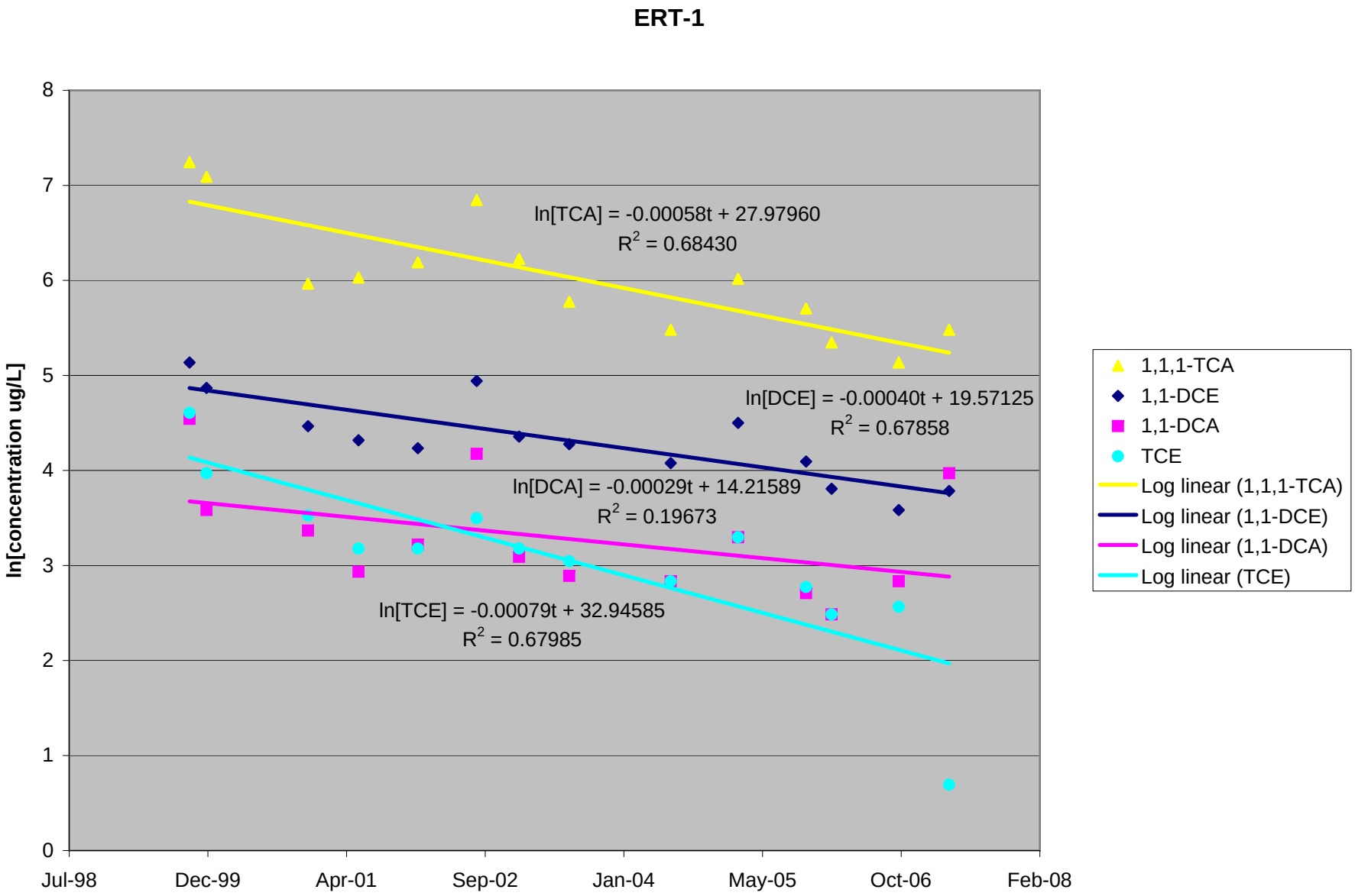

ERT-1
ln[concentration ug/L]
8
7
6
5
4
3
2
1
0
Jul-98
Dec-99
Apr-01
Sep-02
Jan-04
May-05
Oct-06
Feb-08
ln[TCA] = -0.00058t + 27.97960
R2 = 0.68430
ln[DCE] = -0.00040t + 19.57125
R2 = 0.67858
ln[DCA] = -0.00029t + 14.21589
R2 = 0.19673
ln[TCE] = -0.00079t + 32.94585
R2 = 0.67985
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCE)
Log linear (1,1-DCA)
Log linear (TCE)

Figure 6

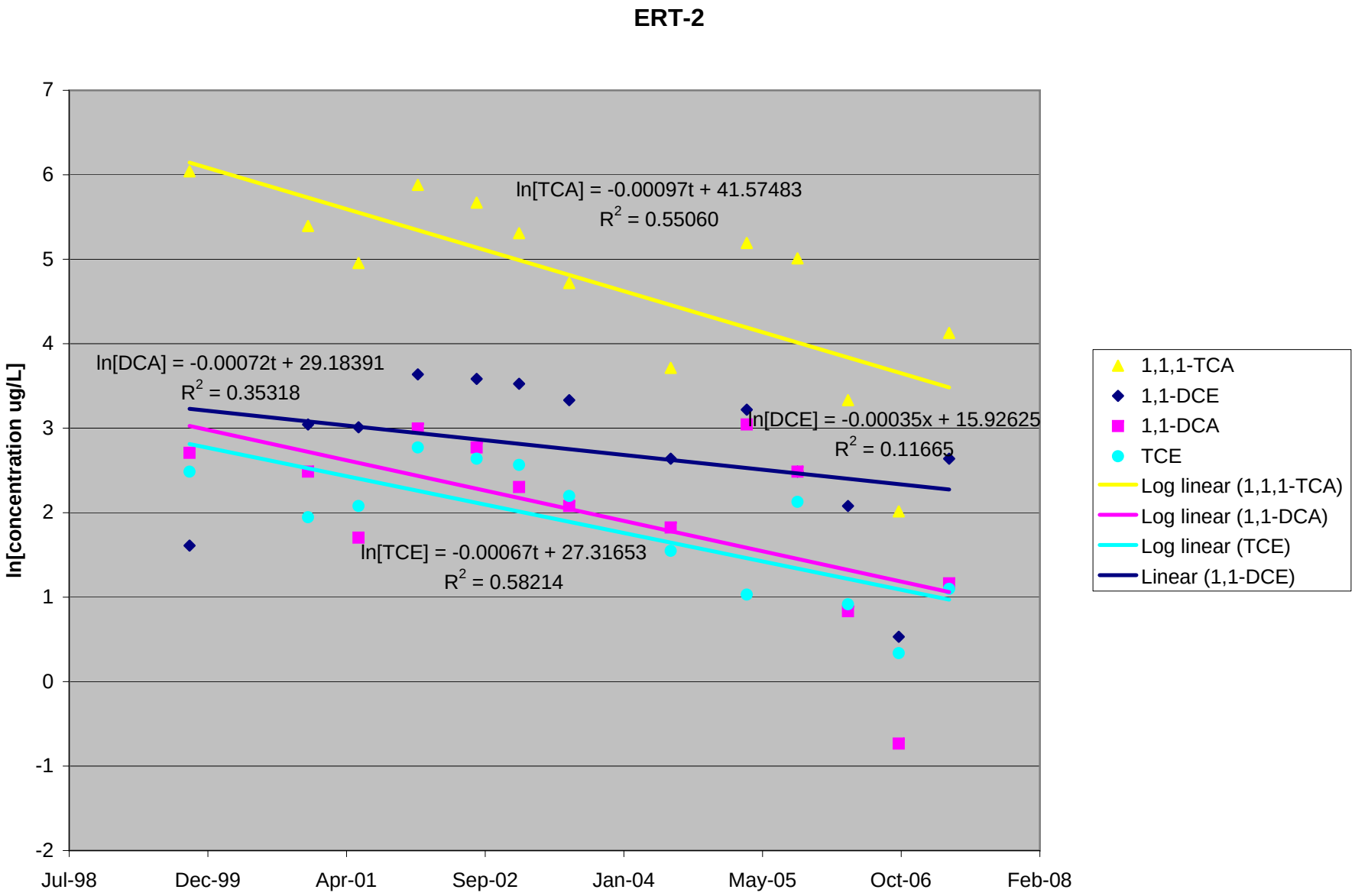

ERT-2
ln[concentration ug/L]
7
6
5
4
3
2
1
0
-1
-2
Jul-98
Dec-99
Apr-01
Sep-02
Jan-04
May-05
Oct-06
Feb-08
ln[TCA] = -0.00097t + 41.57483
R2 = 0.55060
ln[DCA] = -0.00072t + 29.18391
R2 = 0.35318
ln[DCE] = -0.00035x + 15.92625
R2 = 0.11665
ln[TCE] = -0.00067t + 27.31653
R2 = 0.58214
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCA)
Log linear (TCE)
Linear (1,1-DCE)

Figure 6

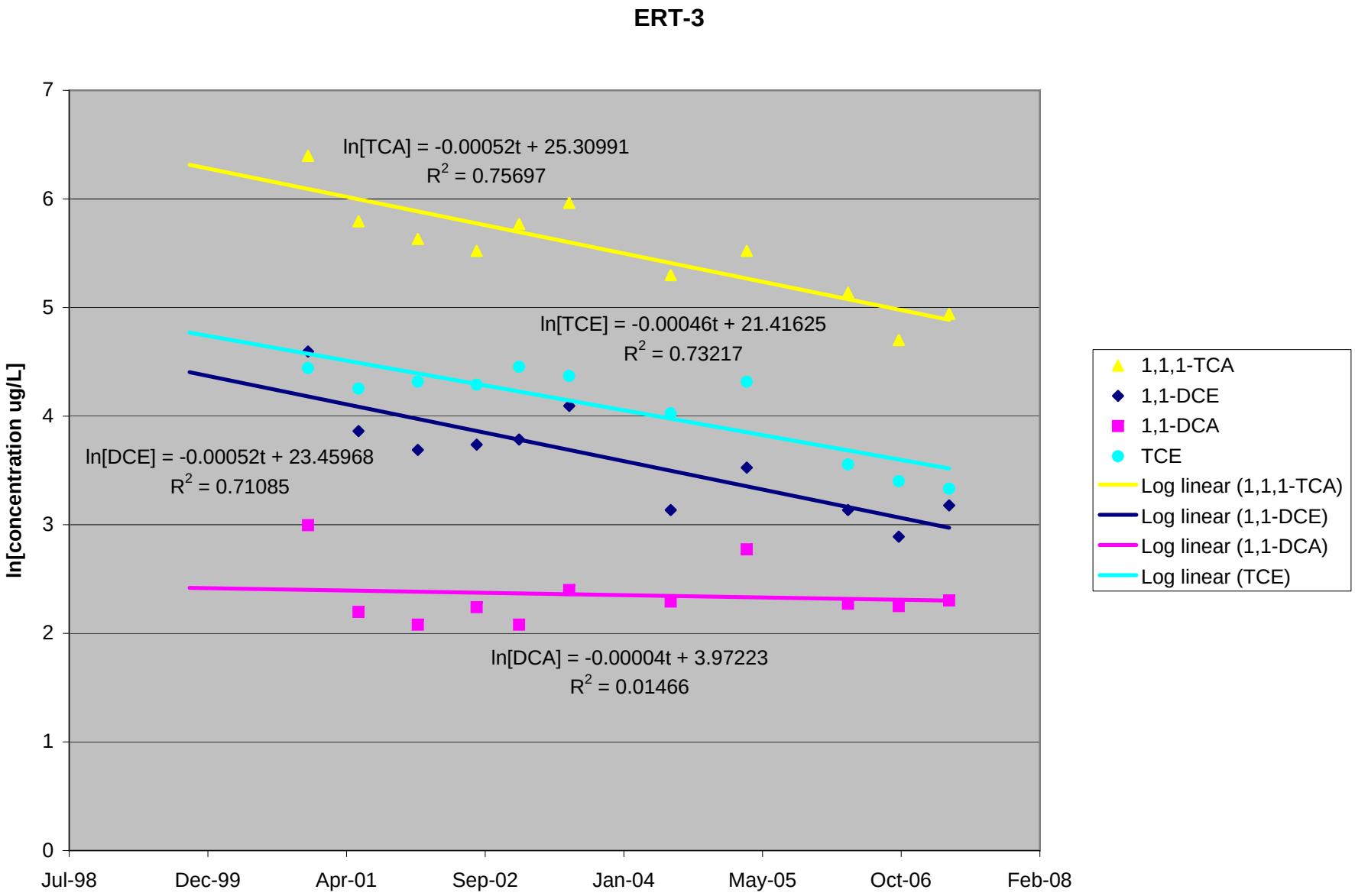

ERT-3
ln[TCA] = -0.00052t + 25.30991
R2 = 0.75697
ln[TCE] = -0.00046t + 21.41625
R2 = 0.73217
ln[DCE] = -0.00052t + 23.45968
R2 = 0.71085
ln[DCA] = -0.00004t + 3.97223
R2 = 0.01466
ln[concentration ug/L]
0
1
2
3
4
5
6
7
Jul-98
Dec-99
Apr-01
Sep-02
Jan-04
May-05
Oct-06
Feb-08
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCE)
Log linear (1,1-DCA)
Log linear (TCE)

Figure 6

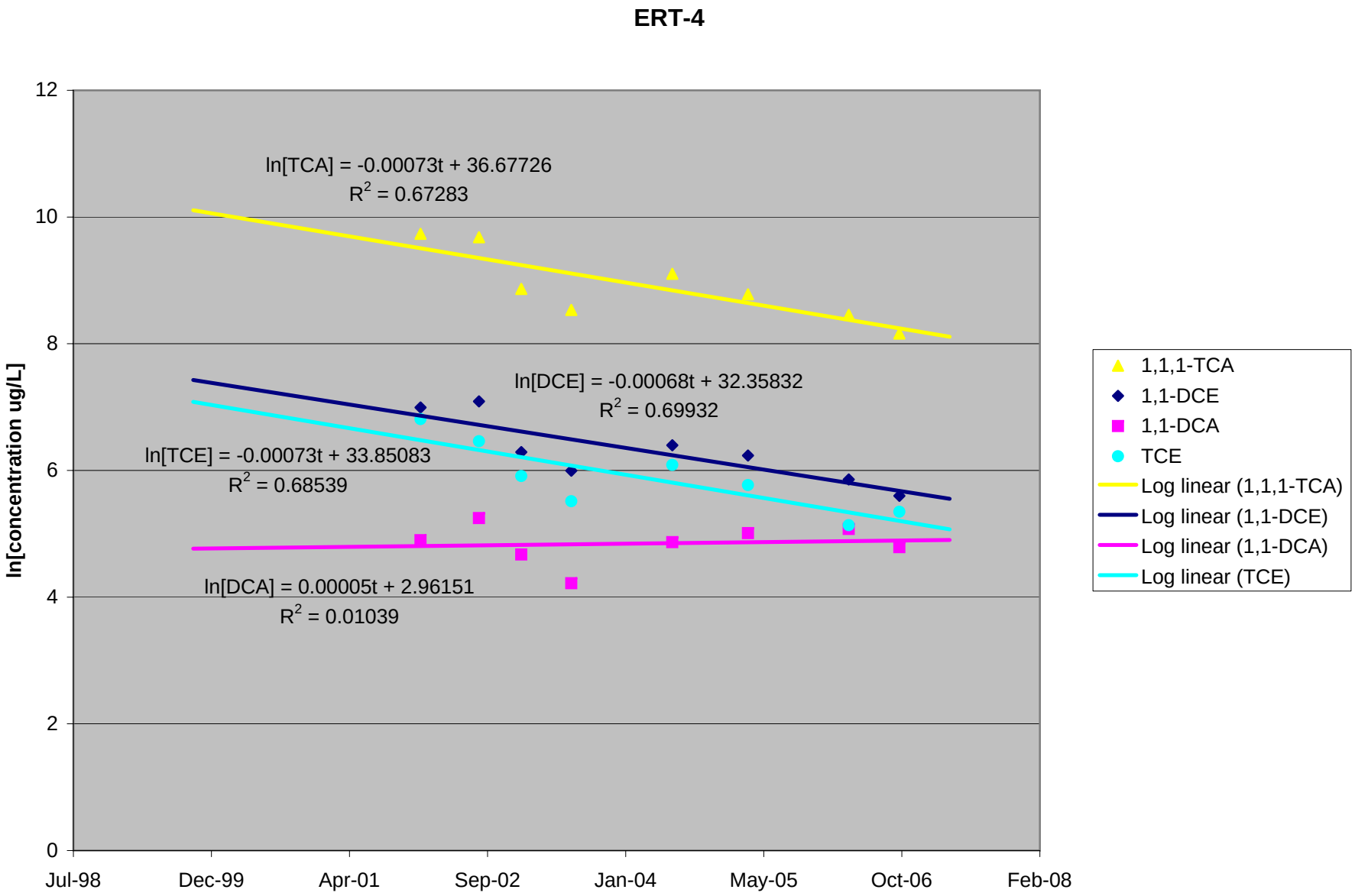

ERT-4
ln[concentration ug/L]
12
10
8
6
4
2
0
Jul-98
Dec-99
Apr-01
Sep-02
Jan-04
May-05
Oct-06
Feb-08
ln[TCA] = -0.00073t + 36.67726
R2 = 0.67283
ln[DCE] = -0.00068t + 32.35832
R2 = 0.69932
ln[TCE] = -0.00073t + 33.85083
R2 = 0.68539
ln[DCA] = 0.00005t + 2.96151
R2 = 0.01039
1,1,1-TCA
1,1-DCE
1,1-DCA
TCE
Log linear (1,1,1-TCA)
Log linear (1,1-DCE)
Log linear (1,1-DCA)
Log linear (TCE)

Figure 6

Near-Field Wells

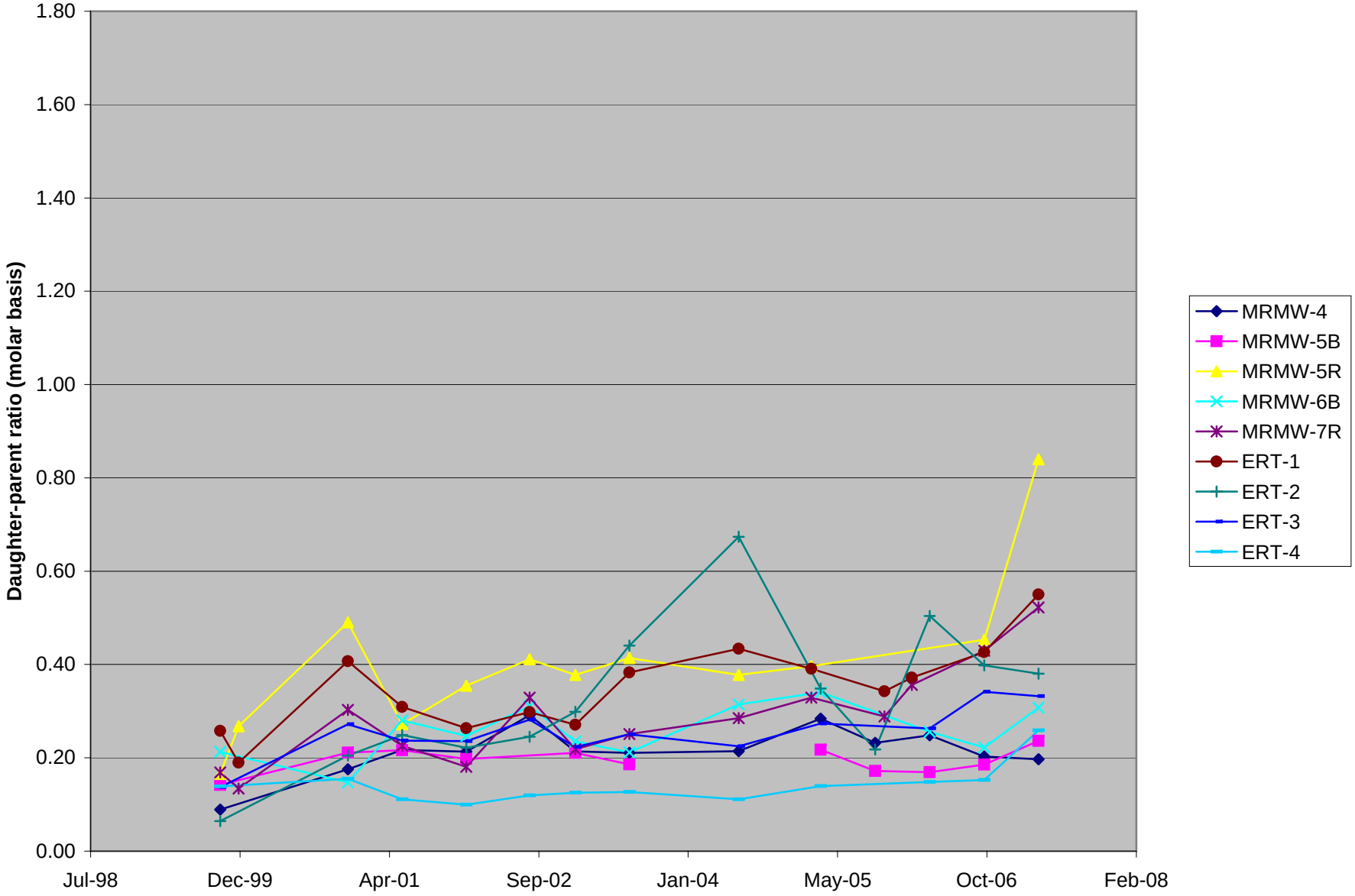


Figure 7
Page 1 of 2

Far-Field Wells

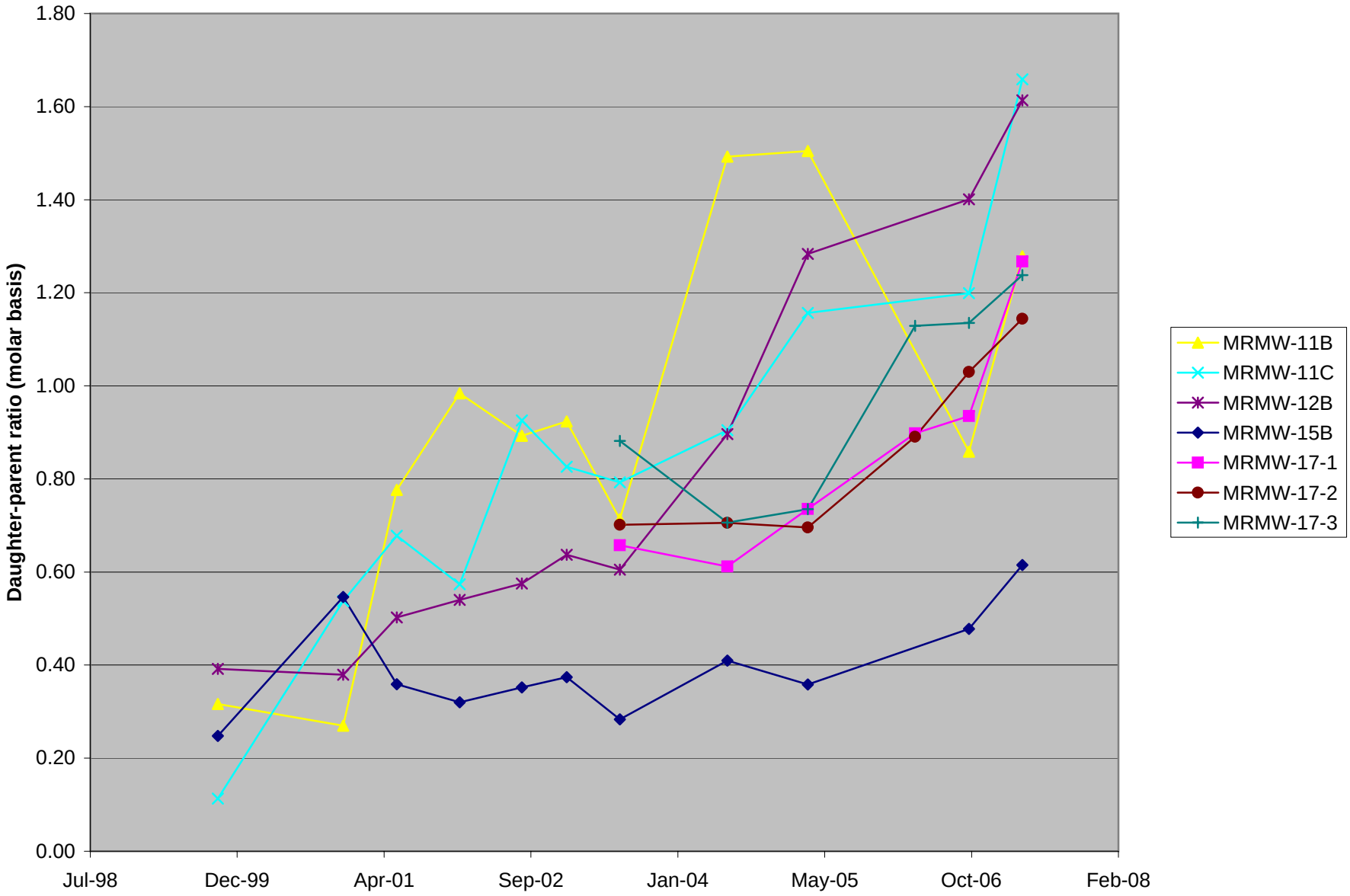


Figure 7
Page 2 of 2

MW20-1 ND
MW20-2 ND
MW20-3 ND
MW-8B ND
MW19-1 ND
MW19-2 ND
MW19-3 ND
MW-14B ND
GAC/RW-60 ND
GAC/RW-21 ND
GAC/RW-58 3.3
GAC/RW-29 11
MW-10B ND
MW18-1 ND
MW18-2 ND
MW18-3 ND
MW-9 ND
MW-9B 0.7
MW17-1 80
MW17-2 79
MW17-3 73
GAC/RW-73 45
MW-16 2.7
MW-12B 72
MW-15B 200
MW-13B ND
GAC/RW-41 14
MW-11B 24
MW-11C 19
ERT-2 62
ERT-1 240
MW-5R 130
MW-5B 2600
MW-7R 250
ERT-3 140
ERT-4 28
MW-6B 17
MW-4 1700
MW-1B ND
5
200
1000
200

Water Tank
High Falls
Sandpits
Aqueduct Siphon House
High Falls Cem
CATSKILL GRADE
CANAL ROAD
SCHOOL HILL RD
COUNTY ROAD 209
MOSS BROOK
CREEK

Wells:
- Residential
- Monitoring
- Isocontours (µg/L)
- Water District Boundary

NOTES:
-Features placed utilizing aerial photography, historical documents, and field notes. Horizontal accuracy is approximate.
-Isocontours based on data collected in April 2007
-ND = Not Detected (<Quantitation Limit)
-NM = Not Measured
-Coordinate System= NAD83 UTM Zone 18N

0 0.25 0.5 1 Miles

US ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

MOHONK ROAD INDUSTRIAL PLANT
ULSTER COUNTY, NEW YORK

FIGURE 8
1,1,1-TRICHLOROETHANE (TCA) ISOCONTOURS (µg/L)

DESIGNED BY: ASG	CHECKED BY: RMP
DRAWN BY: JLG	REVISED BY:
DATE: APRIL 2008	

K:\MissionProjects\ltwmrp\GIS\arcgismaps\MNA_Evaluation\FIG8_TCA_ANSID_02APR08.mxd

MW20-1 ND
MW20-2 ND
MW20-3 ND
MW-8B ND
MW19-1 ND
MW19-2 ND
MW19-3 ND
MW-14B ND
GAC/RW-60 ND
GAC/RW-21 ND
GAC/RW-58 ND
GAC/RW-29 0.78
MW-10B ND
MW18-1 ND
MW18-2 ND
MW18-3 ND
MW-9 ND
MW-9B ND
MW17-1 8.4
MW17-2 5.4
MW17-3 0.6
5
GAC/RW-73 6.2
MW-16 ND
MW-12B 13
MW-15B 3.9
MW-13B 1.1
GAC/RW-41 4.4
MW-11B 3.5
MW-11C 3.3
ERT-2 3
ERT-1 2
MW-5R 7
MW-5B 120
MW-7R 1.9
ERT-3 28
100
ERT-4 9.2
MW-6B ND
MW-4 970
5
MW-1B ND

Wells:

- Residential
- Monitoring
- Isocontours (µg/L)
- Water District Boundary

NOTES:
-Features placed utilizing aerial photography, historical documents, and field notes. Horizontal accuracy is approximate.
-Isocontours based on data collected in April 2007
-ND = Not Detected (<Quantitation Limit)
-NM = Not Measured
-Coordinate System= NAD83 UTM Zone 18N

0 0.25 0.5 1 Miles

US ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

MOHONK ROAD INDUSTRIAL PLANT
ULSTER COUNTY, NEW YORK

FIGURE 9
TRICHLOROETHENE (TCE)
ISOCONTOURS (µg/L)

DESIGNED BY: ASG	CHECKED BY: RMP
DRAWN BY: JLG	REVISED BY:
DATE: APRIL 2008	

K:\Mission\Projects\htw\mrp\GIS\arcgis\maps\MNA_Evaluation\FIG9_TCE_ANSID_02APR08.mxd

MW20-1 ND
MW20-2 ND
MW20-3 ND
MW-8B ND
MW19-1 ND
MW19-2 ND
MW19-3 ND
MW-14B ND
GAC/RW-60 ND
GAC/RW-21 8.5
GAC/RW-58 8.6
GAC/RW-29 12
MW-10B ND
MW18-1 ND
MW18-2 ND
MW18-3 ND
MW-9 ND
MW-9B ND
MW17-1 58
MW17-2 59
MW17-3 49
GAC/RW-73 35
MW-16 1.6
MW-12B 56
MW-15B 60
MW-13B ND
GAC/RW-41 12
MW-11B 17
MW-11C 18
ERT-2 14
ERT-1 44
MW-5R 47
MW-5B 420
MW-7R 43
ERT-3 25
ERT-4 3.7
MW-6B 3.8
MW-4 210
MW-1B ND
5
100

0 0.25 0.5 1 Miles

Wells:
- Residential
- Monitoring
- Isocontours (µg/L)
- Water District Boundary

NOTES:
-Features placed utilizing aerial photography, historical documents, and field notes. Horizontal accuracy is approximate.
-Isocontours based on data collected in April 2007
-ND = Not Detected (<Quantitation Limit)
-NM = Not Measured
-Coordinate System= NAD83 UTM Zone 18N

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MOHONK ROAD INDUSTRIAL PLANT
ULSTER COUNTY, NEW YORK

FIGURE 10
1,1-DICHLOROETHENE (DCE) ISOCONTOURS (µg/L)

DESIGNED BY: ASG	CHECKED BY: RMP
DRAWN BY: JLG	REVISED BY:
DATE: APRIL 2008	

K:\Mission\Projects\htw\mrp\GIS\arcgismaps\MNA_Evaluation\FIG10_DCE_ANSID_02APR08.mxd

MW20-1 ND
MW20-2 ND
MW20-3 ND
MW-8B ND
MW19-1 ND
MW19-2 ND
MW19-3 ND
MW-14B 0.82
GAC/RW-60 1.1
GAC/RW-21 3.6
GAC/RW-58 11
GAC/RW-29 9.3
MW-10B ND
MW18-1 ND
MW18-2 ND
MW18-3 ND
MW-9 ND
MW-9B ND
MW17-1 16
MW17-2 16
MW17-3 17
GAC/RW-73 11
MW-16 ND
MW-12B 29
5
MW-15B 30
MW-13B ND
GAC/RW-41 2.2
MW-11B 5.4
MW-11C 5
ERT-2 3.2
ERT-1 53
MW-5R 33
MW-5B 27
MW-7R 53
ERT-3 10
MW-4 34
ERT-4 1.6
MW-6B ND
MW-1B ND

Water Tank
High Falls
CATSKILL GRADE
CANAL ROAD
Aqueduct Siphon House
SCHOOL HILL RD
MOSSY BROOK ROAD
CREEK
High Falls Cem

0 0.25 0.5 1 Miles

Wells:
- Residential
- Monitoring
- Isocontours (µg/L)
- Water District Boundary

NOTES:
-Features placed utilizing aerial photography, historical documents, and field notes. Horizontal accuracy is approximate.
-Isocontours based on data collected in April 2007
-ND = Not Detected (<Quantitation Limit)
-NM = Not Measured
-Coordinate System= NAD83 UTM Zone 18N

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KANSAS CITY DISTRICT

MOHONK ROAD INDUSTRIAL PLANT
ULSTER COUNTY, NEW YORK

FIGURE 11
1,1-DICHLOROETHANE (DCA) ISOCONTOURS (µg/L)

DESIGNED BY: ASG	CHECKED BY: RMP
DRAWN BY: JLG	REVISED BY:
DATE: APRIL 2008	

K:\MissionProjects\htwmrp\GIS\arcgismaps\MNA_Evaluation\FIG11_DCA_ANSID_02APR08.mxd

MW20-1
ND
MW20-2
ND
MW20-3
ND
MW-8B
ND
MW19-1
0.87
MW19-2
ND
MW19-3
ND
MW-14B
ND
GAC/RW-60
NM
GAC/RW-21
NM
GAC/RW-58
NM
GAC/RW-29
NM
MW-10B
ND
MW18-1
ND
MW18-2
ND
MW18-3
ND
MW-9
ND
MW-9B
1
MW17-1
8.4
MW17-2
11
MW17-3
10
GAC/RW-73
NM
MW-16
8.9
MW-12B
31
MW-15B
9.3
MW-13B
ND
GAC/RW-41
NM
MW-11B
7.2
MW-11C
5.9
ERT-1
8.6
ERT-2
2.1
MW-5R
3.1
MW-5B
5
MW-7R
3.9
ERT-3
65
ERT-4
12
MW-6B
2.3
MW-4
4
MW-1B
ND

Wells:

- Residential
- Monitoring
- Isocontours (µg/L)
- Water District Boundary

NOTES:
-Features placed utilizing aerial photography, historical documents, and field notes. Horizontal accuracy is approximate.
-Isocontours based on data collected in April 2007
-ND = Not Detected (<Quantitation Limit)
-NM = Not Measured
-Coordinate System= NAD83 UTM Zone 18N

0 0.25 0.5 1 Miles

US ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

MOHONK ROAD INDUSTRIAL PLANT
ULSTER COUNTY, NEW YORK

FIGURE 12
1,4-DIOXANE
ISOCONTOURS (µg/L)

DESIGNED BY: ASG	CHECKED BY: RMP
DRAWN BY: JLG	REVISED BY:
DATE: APRIL 2008	

K:\MissionProjects\htwmrp\GIS\arcgis\maps\MNA_Evaluation\FIG12_DIOXANE_ANSID_02APR08.mxd

Tables

Table 1. 1,1,1-TCA Rate Constants

	Well ID	C_o (ug/L)	C_o Date	Goal C (ug/L)	k $Days^{-1}$	R^2	Half-Life Days	To Achieve Goal Days	To Achieve Goal Years
Near-field	**MW-4**	1700	Apr-07	5	**0.00066**	**0.81**	**1050**	**8832**	**24.2**
	MW-5B	2600	Apr-07	5	*0.00017*	*0.13*			
	MW-5R	130	Apr-07	5	**0.00054**	**0.38**	**1284**	**6034**	**16.5**
	MW-6B	17	Apr-07	5	**0.00055**	**0.54**	**1260**	**2225**	**6.1**
	MW-7R	250	Apr-07	5	**0.00044**	**0.60**	**1575**	**8891**	**24.3**
	ERT-1	240	Apr-07	5	**0.00058**	**0.68**	**1195**	**6674**	**18.3**
	ERT-2	62	Apr-07	5	**0.00097**	**0.55**	**715**	**2596**	**7.1**
	ERT-3	140	Apr-07	5	**0.00052**	**0.76**	**1333**	**6408**	**17.5**
	ERT-4	3500	Oct-06	5	**0.00073**	**0.67**	**950**	**8974**	**24.6**
Far-field	**MW-11B**	24	Apr-07	5	**0.00064**	**0.60**	**1083**	**2451**	**6.7**
	MW-11C	19	Apr-07	5	**0.00081**	**0.94**	**856**	**1648**	**4.5**
	MW-12B	72	Apr-07	5	**0.00059**	**0.88**	**1175**	**4521**	**12.4**
	MW-15B	200	Apr-07	5	**0.00023**	**0.47**	**3014**	**16039**	**43.9**
	MW-17-1	80	Apr-07	5	**0.00068**	**0.88**	**1019**	**4077**	**11.2**
	MW-17-2	79	Apr-07	5	**0.00057**	**0.91**	**1216**	**4842**	**13.3**
	MW-17-3	73	Apr-07	5	*0.00040*	*0.56*			

Notes:
Values shown in bold text represent statistically discernible trends with defensible predictions; those in italics are not statistically significant trends and are of limited (or no) predictive value. Rate constants were not used in predictive analysis for wells where the trends were not statistically significant.

-- Goal achieved as of Apr-07

na Not applicable or data too scattered for determination of trend

Table 2. 1,1-DCE Rate Constants

	Well ID	C_o (ug/L)	C_o Date	Goal C (ug/L)	k Days^{-1}	R^2	Half-Life Days	To Achieve Goal Days	To Achieve Goal Years
Near-field	**MW-4**	210	Apr-07	5	**0.00054**	**0.57**	**1284**	**6922**	**19.0**
	MW-5B	420	Apr-07	5	*0.00012*	*0.04*			
	MW-5R	47	Apr-07	5	*0.00029*	*0.12*			
	MW-6B	3.8	Apr-07	5	**0.00042**	**0.32**	**1650**	--	--
	MW-7R	43	Apr-07	5	**0.00021**	**0.23**	**3301**	**10246**	**28.1**
	ERT-1	44	Apr-07	5	**0.00040**	**0.68**	**1733**	**5437**	**14.9**
	ERT-2	14	Apr-07	5	na	na	na		
	ERT-3	24	Apr-07	5	**0.00052**	**0.71**	**1333**	**3017**	**8.3**
	ERT-4	270	Oct-06	5	**0.00068**	**0.70**	**1019**	**5866**	**16.1**
Far-field	**MW-11B**	17	Apr-07	5	**0.00014**	**0.25**	**4951**	**8741**	**23.9**
	MW-11C	18	Apr-07	5	**0.00047**	**0.70**	**1475**	**2725**	**7.5**
	MW-12B	56	Apr-07	5	*0.00007*	*0.05*			
	MW-15B	60	Apr-07	5	*0.00005*	*0.03*			
	MW-17-1	58	Apr-07	5	*0.00024*	*0.21*			
	MW-17-2	50	Apr-07	5	*0.00020*	*0.41*			
	MW-17-3	49	Apr-07	5	*-0.00004*	*0.02*			

Notes:
Values shown in bold text represent statistically discernible trends with defensible predictions; those in italics are not statistically significant trends and are of limited (or no) predictive value. Rate constants were not used in predictive analysis for wells where the trends were not statistically significant.

-- Goal achieved as of Apr-07

na Not applicable or data too scattered for determination of trend

Table 3. 1,1-DCA Rate Constants

	Well ID	C_o (ug/L)	C_o Date	Goal C (ug/L)	k $Days^{-1}$	R^2	Half-Life Days	To Achieve Goal Days	To Achieve Goal Years
Near-field	**MW-4**	34	Apr-07	5	**0.00024**	**0.52**	**2888**	**7987**	**21.9**
	MW-5B	27	Apr-07	5	**0.00031**	**0.32**	**2236**	**5440**	**14.9**
	MW-5R	33	Apr-07	5	*-0.00006*	*0.01*			
	MW-6B	0	Apr-07	5	**0.00058**	**0.59**	**1195**	--	--
	MW-7R	53	Apr-07	5	*-0.00004*	*0.01*			
	ERT-1	53	Apr-07	5	*0.00029*	*0.20*			
	ERT-2	3.2	Apr-07	5	**0.00072**	**0.35**	**963**	--	--
	ERT-3	10	Apr-07	5	*0.00004*	*0.01*			
	ERT-4	120	Oct-06	5	*-0.00005*	*0.01*			
Far-field	**MW-11B**	5.4	Apr-07	5	**0.00037**	**0.39**	**1873**	**208**	**0.6**
	MW-11C	5	Apr-07	5	**0.00032**	**0.45**	**2166**	--	--
	MW-12B	29	Apr-07	5	*-0.00006*	*0.04*			
	MW-15B	30	Apr-07	5	*0.00006*	*0.17*			
	MW-17-1	16	Apr-07	5	*0.00011*	*0.06*			
	MW-17-2	16	Apr-07	5	*0.00017*	*0.24*			
	MW-17-3	17	Apr-07	5	*0.00021*	*0.25*			

Notes:
Values shown in bold text represent statistically discernible trends with defensible predictions; those in italics are not statistically significant trends and are of limited (or no) predictive value. Rate constants were not used in predictive analysis for wells where the trends were not statistically significant.

-- Goal achieved as of Apr-07

na Not applicable or data too scattered for determination of trend

Table 4. TCE Rate Constants

	Well ID	C_o (ug/L)	C_o Date	Goal C (ug/L)	k $Days^{-1}$	R^2	Half-Life Days	To Achieve Goal Days	To Achieve Goal Years
Near-field	**MW-4**	970	Apr-07	5	**0.00026**	**0.58**	**2666**	**20261**	**55.5**
	MW-5B	120	Apr-07	5	*-0.00007*	*0.02*			
	MW-5R	7	Apr-07	5	**0.00058**	**0.49**	**1195**	**580**	**1.6**
	MW-6B	0	Apr-07	5	na	na	na	--	--
	MW-7R	1.9	Apr-07	5	**0.00030**	**0.40**	**2310**	--	--
	ERT-1	2	Apr-07	5	**0.00079**	**0.68**	**877**	--	--
	ERT-2	3	Apr-07	5	**0.00067**	**0.58**	**1035**	--	--
	ERT-3	28	Apr-07	5	**0.00046**	**0.73**	**1507**	**3745**	**10.3**
	ERT-4	210	Oct-06	5	**0.00073**	**0.69**	**950**	**5120**	**14.0**
Far-field	**MW-11B**	3.5	Apr-07	5	**0.00025**	**0.21**	**2773**	--	--
	MW-11C	3.3	Apr-07	5	**0.00035**	**0.72**	**1980**	--	--
	MW-12B	13	Apr-07	5	**0.00016**	**0.33**	**4332**	**5972**	**16.4**
	MW-15B	3.9	Apr-07	5	*0.00007*	*0.12*		--	--
	MW-17-1	8.4	Apr-07	5	**0.00019**	**0.54**	**3648**	**2730**	**7.5**
	MW-17-2	5.4	Apr-07	5	**0.00042**	**0.68**	**1650**	**183**	**0.5**
	MW-17-3	0.6	Apr-07	5	**0.00150**	**0.89**	**462**	--	--

Notes:
Values shown in bold text represent statistically discernible trends with defensible predictions; those in italics are not statistically significant trends and are of limited (or no) predictive value. Rate constants were not used in predictive analysis for wells where the trends were not statistically significant.

-- Goal achieved as of Apr-07

na Not applicable or data too scattered for determination of trend

Table 5. October 2006 and April 2007 Geochemical Parameters

	Well ID	Chlorinated solvent concentrations	Sampling Date	Dissolved Oxygen	ORP (mV)	Nitrate	Ferrous Iron	Sulfate	Methane	Geochemical Conditions
Near-Field	MW-4	TCA/TCE far above 5 ppb, DCE far above 5 ppb, DCA ablove 5 ppb, chloroethane ~4 ppb, vinyl chloride detection	Oct-06	0.23	29	0.1	0.05	37	0.76	iron-reducing
			Apr-07	4.6	46	0.1	3.3	50	0.46	
	MW-5B	TCA/TCE far above 5 ppb, DCE far above 5 ppb, DCA ablove 5 ppb, chloroethane ~3 ppb	Oct-06	7.2	43	0.28	0.03			aerobic
			Apr-07	3	95	0.16	0.16			
	MW-5R	TCA well above 5ppbDCE far above 5 ppb, DCA ablove 5 ppb,	Oct-06	4	129	0.93	0.05			aerobic
			Apr-07	2.2	125	0.73	0.08			
	MW-6B	TCA above 5 ppb, DCE/DCA < 5 ppb	Oct-06	4.4	31	2.1	0.04			aerobic
			Apr-07	3.5	98	2	0.12			
	MW-7R	TCA well above 5ppb. DCE/DCA above 5 ppb	Oct-06	3.2	155	1.2	0.1			aerobic
			Apr-07	3.4	128	0.77	0.64			
	ERT-1	TCA well above 5ppb. DCE/DCA above 5 ppb	Oct-06	30.6	170	2	0.03			aerobic
			Apr-07	2.6	132	0.77	0.09			
	ERT-2	TCA above 5 ppb, DCE/DCA < 5 ppb	Oct-06	3.1	35	5.7	0.06			aerobic
			Apr-07	1.6	88	3.8	0.19			
	ERT-3	TCA/TCE well above 5ppb, DCE/DCA > 5 ppb	Oct-06	4.2	166	1.5	0.01			aerobic
			Apr-07	2.1	53	1.5	0.23			
	ERT-4	TCA/TCE far above 5 ppb, DCE/DCA far above 5 ppb	Oct-06	4.5	147	0.9	0.29			aerobic
			Apr-07	6	71	ND (0.05)	1.3			
Far-Field	MW-11B	TCA above 5 ppb, DCE/DCA >5 ppb	Oct-06	1.6	-101	0.17	2.4	21.1	ND	iron-reducing
			Apr-07	0.46	-103	ND	3.3			
	MW-11C	TCA above 5 ppb, DCE/DCA >5 ppb	Oct-06	2.4	29	0.54	0.06			aerobic
			Apr-07	2.2	107	0.29	0.23			
	MW-12B	TCA above 5 ppb, DCE/DCA >5 ppb	Oct-06	1.8	130	0.63	0.08			aerobic
			Apr-07	1.3	126	0.48	0.16			
	MW-15B	TCA far above 5 ppb/TCE above 5 ppb, DCE/DCA > 5 ppb	Oct-06	2.1	116	0.18	0.26			aerobic
			Apr-07	9.6	77	0.13	0.31			
	MW-17-1	TCA well above 5ppb, DCE/DCA> 5ppb, chloroethane detection	Oct-06			0.97	0.05			aerobic
			Apr-07	2.5	125	0.88	0.19			
	MW-17-2	TCA well above 5ppb, DCE/DCA> 5ppb, chloroethane detection	Oct-06			0.8	0.28			aerobic
			Apr-07	1.5	130	0.76	0.37			
	MW-17-3	TCA well above 5ppb, cis-1,2-DCE ~ 5 ppb, chloroethane detections	Oct-06			0.73	0.43	31	0.021	iron-reducing
			Apr-07	0.91	1.4	0.6	0.51	28		
Residential Wells	GAC/RW-21	ND TCA, TCE < 1ppb, VC~2 ppb	Oct-06	33.6	23.3	ND	2.8	11.6	0.11	sulfate-reducing
			Apr-07	0.51	-59	ND	3.2			
	GAC/RW-29	TCA above 5 ppb, TCE< 1ppb	Oct-06	12.2	257	0.13	0.1	28.4		aerobic
			Apr-07	3.3	171	0.2	0.1			
	GAC/RW-41	TCA above 5 ppb, TCE ~4 ppb	Apr-07	4.6	169	0.87	0.05			aerobic
	GAC/RW-58	TCA~3 ppb, TCE<1 ppb, VC<1ppb	Oct-06	32.6	196	1.5	0.06	24.4	ND	nitrate-reducing
			Apr-07	0.74	139	1.2	0.1			
	GAC/RW60	TCA< 1ppb, ND TCE, VC	Oct-06	25.9	250	0.4	0.06	14.6		aerobic
			Apr-07	1.04	192	0.2	0.1			
	GAC/RW-73	TCA,TCE>MCL; ND VC	Oct-06	2.75	137	0.8	0.07			aerobic
Beyond Far-Field	MW 13B (soutwest)	~1 ppb TCE, April 2007	Oct-06	0.35	-154	ND	1.6	40	0.015	iron-reducing
			Apr-07	0.06	0.3	ND	1.5	36		
	MW 18-1 (west)	< 1ppb 1,1-DCE	Oct-06	1.4	-33	ND	0.3		0.063	iron-reducing
			Apr-07	1.3	-117	ND	0.4	15	0.033	
	MW 18-2	< 1ppb DCA	Oct-06	1.4	-56	ND	0.1		0.071	nitrate- to iron-reducing
			Apr-07	1.6	-130	ND	0.1			
	MW 18-3	< 1ppb DCA	Oct-06	1.2	-61	ND	0.2	13	0.16	iron-reducing
			Apr-07	0.9	-148	ND	0.2			
	MW 14B (north)	< 1ppb DCA	Oct-06	0.6	-20	ND	2.7	17	0.076	iron-reducing
			Apr-07	0.4	-2	ND	2.8			
	MW 19-1 (north)	no chlorinated solvent detections	Oct-06	1.5	-42	0.33	3.3	30	0.62	iron-reducing
			Apr-07	0.9	-40	0.45	2.6			
	MW 19-2	no chlorinated solvent detections	Oct-06	4	-87	ND	1.6	4	2.2	iron-reducing
			Apr-07	0.9	-87	ND	3.3			
	MW 19-3	no chlorinated solvent detections	Oct-06	0.91	-140	0.1	0.2	ND	3.62	nitrate- to -iron-reducing
			Apr-07	0.44	-188	ND	0.3			
	MW 10B (northeast)	no chlorinated solvent detections	Oct-06	3.6	-96	ND	0.2	24	ND	nitrate- to iron-reducing
			Apr-07	0.72	139	0.2	0.1	38		

Note: All units in mg/L unless otherwise specified

Attachment 1

Mohonk Road Industrial Plant Site
Historical Summary of Groundwater Analytical Results
Monitoring Well Sampling Events

Monitoring Well ID	Sample Date	1,1-DCE	1,1-DCA	1,1,1-TCA	TCE	1,4-Dioxane
MRMW-1B	October 1999	10U	10U	10U	10U	NA
	December 2000	<3U	<3U	<3U	<3U	NA
	June 2001	<0.1U	<0.1U	<0.1U	<0.1U	NA
	January 2002	<0.4U	<0.4U	<0.3U	<0.3U	NA
	August 2002	<1.0J	<1.0J	<1.0J	<1.0J	NA
	January 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	1.3J
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2005	0.5U	0.5U	0.5U	0.5U	2U
	April 2006	0.5U	0.5U	0.5U	0.5U	2R
	October 2006	0.5U	0.5U	0.5U	0.5U	2U
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
MRMW-4	October 1999	380J	62	6800J	1600	NA
	December 2000	500	75J	4500	1600	NA
	June 2001	516	49.5	3580	1470	NA
	January 2002	891	64	6160	2490	NA
	August 2002	650	49	3300	1800	NA
	January 2003	428	32	2960	1650	NA
	July 2003	306	34	2220	1420	NA
	July 2004	310	33J	2200	1300	9.6
	April 2005	290	41	1600	1300	13
	October 2005	100	39J	820	800	16J
	April 2006	240	31J	1500J	1000J	5.9
	October 2006	120	43	1100	1100	4
	April 2007	210	34	1700	970	NA
MRMW-5B	October 1999	250	50	2900	130	NA
	December 2000	280	43	2100	120	NA
	June 2001	327	47.0	2370	91.0	NA
	January 2002	1360	92.0	10,100	436.0	NA
	January 2003	445	19	3030	171	NA
	July 2003	171	27	1460	62	NA
	July 2004	NS	NS	NS	NS	NS
	April 2005	440	35	3000	270	15
	October 2005	97	41J	1100	96	27
	April 2006	280	28J	2500	230J	12J
	October 2006	110	8.7	880	87	3.1
	April 2007	420	27	2600	120	NA
MRMW-5R	October 1999*	28	7J	290J	16	NA
	December 1999	270	22	1500	62	NA
	December 2000	120	23	400	34	NA
	June 2001	75.0	17.4	466	24.5	NA
	January 2002	339.0	67	1570	67	NA
	August 2002	110	22	440	27	NA
	January 2003	84	19	374	22	NA
	July 2003	30	5	116	8	NA
	July 2004	61	19	290	10	NA
	March 2005	67	14	280	20	7.1
	October 2006	61	15	230	9.2	5
	April 2007	47	33	130	7	NA
MRMW-6B	October 1999	7J	2J	58	10U	NA
	December 2000	3	<3U	28	<3U	NA
	June 2001	5.7	0.5	30.4	0.2J	NA
	January 2002	13	1	78	0.7J	NA
	August 2002	5.6	0.50J	27	<1J	NA
	January 2003	2	0.4J	14	<0.3U	NA
	July 2003	2	<0.3U	13	<0.3U	NA
	July 2004	3.7	0.42J	18	0.5U	1.6J
	April 2005	1.7	0.59	9.2	0.5U	2.3
	April 2006	2.6	0.5U	14	0.5U	20U
	October 2006	1.5	0.28J	11	0.5U	20R
	April 2007	3.8	0.5U	17	0.5U	NA

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Monitoring Well ID	Sample Date	1,1-DCE	1,1-DCA	1,1,1-TCA	TCE	1,4-Dioxane
MRMW-7R	October 1999*	35	23	470	4J	NA
	December 1999	71	27J	1000	8.9	NA
	December 2000	44	27	320	<3U	NA
	June 2001	39.8	23.2	381	3.8	NA
	January 2002	34	39	550	4	NA
	August 2002	56	60	480	5.0J	NA
	January 2003	23/24	15/15	242/244	3/3	NA
	July 2003	43	24	365	4	NA
	July 2004	25	21	220	3.1	NA
	March 2005	43	22	270	5.6	8
	November 2005	20	16	170	3.5J	11
	May 2006	24	23	200	4.8	NA
	October 2006	33	46	250	1.6	3.9
	April 2007	43	53	250	1.9	NA
MRMW-8B	October 1999	10U	10U	10U	10U	NA
	December 2000	<3U	<3U	<3U	<3U	NA
	June 2001	<0.1U	<0.1U	<0.1U	<0.1U	NA
	January 2002	<0.4U	<0.4U	<0.3U	<0.3U	NA
	January 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	0.89J
	April 2005	0.11J	0.24J	0.5U	0.5U	1.6J
	October 2005	0.5U	0.5U	0.5U	0.5U	0.99J
	April 2006	0.5U	0.5U	0.5U	0.5U	20R/2R
	October 2006	0.5U	0.22J	0.5U	0.5U	2U
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
MRMW-9	October 1999	10U	10U	10U	10U	NA
	December 2000	<3U	<3U	<3U	<3U	NA
	June 2001	<0.1U	<0.1U	<0.1U	<0.1U	NA
	January 2002	<0.4U	<0.4U	0.7J	<0.3U	NA
	August 2002	<0.5	0.27 J	0.73	<0.5	NA
	January 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	2U
	October 2006	0.5U	0.5U	0.5U	0.5U	20R
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
MRMW-9B	October 1999	10U	10U	10U	10U	NA
	December 2000	<3U	<3U	<3U	<3U	NA
	June 2001	0.2J	<0.1U	0.6	<0.1U	NA
	January 2002	<0.4U	<0.4U	0.9J	<0.3U	NA
	August 2002	<0.5	<0.5	<0.5	<0.5	NA
	January 2003	<0.4U	0.3J	0.7J	<0.3U	NA
	July 2003	<0.4U	<0.4U	0.3J	<0.3U	NA
	July 2004	0.5U	0.26J	0.57	0.5U	2.5
	April 2005	0.13J	0.28J	0.69	0.5U	2.6
	October 2005	0.5U	0.26J	0.72	0.5U	3.4
	April 2006	0.5U	0.25J	0.46J	0.5U	1J
	October 2006	0.5U	0.25J	0.47J	0.5U	20R
	April 2007	0.5U	0.5U	0.7J	0.5U	NA
MRMW-10B	October 1999	10U	10U	10U	10U	NA
	December 2000	<3U	<3U	<3U	<3U	NA
	June 2001	<0.1U	<0.1U	<0.1U	<0.1U	NA
	January 2002	<0.4U	<0.4U	<0.3U	<0.3U	NA
	August 2002	<0.5	<0.5	<0.5	<0.5	NA
	January 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	0.86J
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2005	0.5U	0.5U	0.1J	0.5U	2U
	April 2006	0.5U	0.5U	0.5U	0.5U	20UJ
	October 2006	0.5U	0.5U	0.5U	0.5U	2U
	April 2007	0.5U	0.5U	0.5U	0.5U	NA

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Monitoring Well ID	Sample Date	1,1-DCE	1,1-DCA	1,1,1-TCA	TCE	1,4-Dioxane
MRMW-11B	October 1999	29	15	190	11	NA
	December 2000	<3U	36	180	10	NA
	June 2001	24.4	12.3	64.6	4.8	NA
	January 2002	17	6	32	3	NA
	August 2002	28	8.5	56	3.8	NA
	January 2003	17	8	37	3	NA
	July 2003	14J	9J	44J	4J	NA
	July 2004	18	9.3	25	2.9	7
	April 2005	23	10	30	3.8	7.2
	October 2006	18	7.1	40	6.4	20R
	April 2007	17	5.4	24	3.5	NA
MRMW-11C	October 1999	4 J	6 J	120	6 J	NA
	December 2000	40	11	130	7	NA
	June 2001	35.2	7.3	86.0	5.3	NA
	January 2002	28	8	86.0	6	NA
	August 2002	37	9.6	69.0	4.7	NA
	January 2003	35	9	73.0	5	NA
	July 2003	22	4	45	3	NA
	July 2004	14	4.5	28	2.8	5.7
	April 2005	22	5	32	3.6	5.9
	October 2006	11	3	16	2.4	20R
	April 2007	18	5	19	3.3	NA
MRMW-12B	October 1999	72	37	380	23 J	NA
	December 2000	43	18	220	15	NA
	June 2001	67.2	26.8	256	19.6	NA
	January 2002	77	32	276	22	NA
	August 2002	65	36	240	23	NA
	January 2003	72	30	219	18	NA
	July 2003	52	25	174	16	NA
	July 2004	39	24	96	12	11
	April 2005	87	54	150	22	25
	October 2006	47	31	76	14	31J
	April 2007	56	29	72	13	NA
MRMW-13B	October 1999	10U	10U	10U	10U	NA
	December 2000	<3U	<3U	<3U	<3U	NA
	June 2001	<0.1U	<0.1U	<0.1U	<0.1U	NA
	January 2002	<0.4U	<0.4U	<0.3U	<0.3U	NA
	August 2002	<0.5	<0.5	<0.5	<0.5	NA
	January 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	2U
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2005	0.5U	0.5U	0.5U	0.5U	2U
	April 2006	0.5R	0.5R	0.5R	0.5R	2R
	October 2006	0.5U	0.5U	0.5U	0.5U	2U
	April 2007	0.5U	0.5U	0.5U	1.1	NA
MRMW-14B	October 1999	10U	10U	10U	10U	NA
	December 2000	<3U	<3U	<3U	<3U	NA
	June 2001	<0.1U	0.4J	<0.1U	<0.1U	NA
	January 2002	0.5J	1	<0.3U	<0.3U	NA
	August 2002	NS	NS	NS	NS	NA
	January 2003	<0.4U	0.8J	<0.3U	<0.3U	NA
	July 2003	<0.4U	0.6J	<0.3U	<0.3U	NA
	July 2004	0.5U	0.58	0.5U	0.5U	1.6J
	April 2005	0.3J	0.8	0.5U	0.15J	1.9J
	October 2005	0.25J	0.62	0.5U	0.5U	2
	April 2006	0.5U	0.67	0.5U	0.5U	2R
	October 2006	0.5U	0.72	0.5U	0.5U	2U
	April 2007	0.5U	0.82	0.5U	0.5U	NA

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Monitoring Well Sampling Events

Monitoring Well ID	Sample Date	1,1-DCE	1,1-DCA	1,1,1-TCA	TCE	1,4-Dioxane
MRMW-15B	October 1999	39	30	380	4 J	NA
	December 2000	63	37	250	<3U	NA
	June 2001	63.6	35.4	377	3.8	NA
	January 2002	73	40	482	4	NA
	August 2002	54	31	330	5	NA
	January 2003	68	36	380	3	NA
	July 2003	38	30	327	3	NA
	July 2004	56	37	310	3	9.9
	April 2005	48	36	320	3.6	9.3
	October 2006	38	25	180	3.1	40R
	April 2007	60	30	200	3.9	NA
MRMW-16	July 2003	51	12	168	4	NA
	July 2004	60	10	160	8.8	8.9
	October 2006	60	25	140	12	40R
	April 2007	1.7	0.5U	2.9	0.5U	NA
MRMW-17-1	July 2003	63	21	175	11	NA
	July 2004	51	16	150	8.7	18
	April 2005	49	10	110	7.8	14
	April 2006	30	16	70J	7.6	8.4
	October 2006	38	16	79	7.9	20R
	April 2007	58	16	80	8.4	NA
MRMW-17-2	July 2003	60	22	160	10	NA
	July 2004	49	18	130	6.4	15
	April 2005	53	13	130	6.8	15
	April 2006	50	15	100	4.5J	11
	October 2006	37	18	73	5.8	20R
	April 2007	50	16	79	5.4	NA
MRMW-17-3	July 2003	38	24	96	5	NA
	July 2004	41	21	120	1.6	14
	April 2005	46	13	110	1.4	15
	April 2006	36	16	63	0.6	10
	October 2006	35	19	65	0.74	20R
	April 2007	49	17	73	0.6	NA
MRMW-18-1	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.34J	0.5U	0.5U	1.7J
	October 2004	0.23J	0.43J	0.5U	0.5U	2U
	April 2005	0.24J	0.71	0.5U	0.5U	0.78J
	October 2005	0.17J	0.49J	0.5U	0.5U	1J
	April 2006	0.5U	0.32J	0.5U	0.5U	2R
	October 2006	0.5U	0.3J	0.5U	0.5U	2U
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
MRMW-18-2	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.17J	0.5U	0.5U	1.7J
	October 2004	0.5U	0.23J	0.5U	0.5U	2U
	April 2005	0.5U	0.22J	0.5J	0.5J	0.77J
	October 2005	0.5U	0.26J	0.5U	0.5U	0.52J
	April 2006	0.5U	0.19J	0.5U	0.5U	2R
	October 2006	0.5U	0.19J	0.5U	0.5U	2U
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
MRMW-18-3	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.24J	0.5U	0.5U	2U
	October 2004	0.17J	0.4J	0.5U	0.5U	2U
	April 2005	0.19J	0.55	0.5U	0.5U	0.73J
	October 2005	0.15J	0.49J	0.5U	0.5U	0.57J
	April 2006	0.5U	0.27J	0.5U	0.5U	2R
	October 2006	0.5U	0.39J	0.5U	0.5U	2U
	April 2007	0.5U	0.5U	0.5U	0.5U	NA

Mohonk Road Industrial Plant Site
Historical Summary of Groundwater Analytical Results
Monitoring Well Sampling Events

Monitoring Well ID	Sample Date	1,1-DCE	1,1-DCA	1,1,1-TCA	TCE	1,4-Dioxane
MRMW-19-1	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	1.4J
	October 2004	0.5U	0.5U	0.5U	0.5U	2U
	April 2005	0.5U	0.5U	0.5U	0.5U	0.87J
	October 2006	0.5U	0.5U	0.5U	0.5U	20R
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
MRMW-19-2	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	2U
	October 2004	0.5U	0.5U	0.5U	0.5U	2U
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2006	0.5U	0.5U	0.5U	0.5U	20R
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
MRMW-19-3	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	2U
	October 2004	0.5U	0.5U	0.5U	0.5U	2U
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2006	0.5U	0.5U	0.5U	0.5U	20R
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
MRMW-20-1	July 2003	<0.4U	<0.4U	0.3J	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	2U
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2006	0.5U	0.5U	0.5U	0.5U	20R
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
MRMW-20-2	July 2003	<0.4U	<0.4U	0.3J	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	2U
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2006	0.5U	0.5U	0.5U	0.5U	20R
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
MRMW-20-3	July 2003	<0.4U	<0.4U	<0.3U	<0.3U	NA
	July 2004	0.5U	0.5U	0.5U	0.5U	2U
	April 2005	0.5U	0.5U	0.5U	0.5U	2U
	October 2006	0.5U	0.5U	0.5U	0.5U	20R
	April 2007	0.5U	0.5U	0.5U	0.5U	NA
ERT-1	October 1999*	170	94	1400	100	NA
	December 1999	130	36J	1200	53	NA
	December 2000	87J	29J	390	34J	NA
	June 2001	75.0	18.8	416	24.0	NA
	January 2002	69.0	25	488	24.0	NA
	August 2002	140.0	65	940	33.0	NA
	January 2003	78	22	506	24	NA
	July 2003	72	18	322	21	NA
	July 2004	59	17	240	17	NA
	March 2005	90	27	410	27	20
	November 2005	60	15	300	16	18
	May 2006	73	17	360	18	NA
	October 2006	36	17	170	13	8.6
	April 2007	44	53	240	2	NA

Mohonk Road Industrial Plant Site
Historical Summary of Groundwater Analytical Results
Monitoring Well Sampling Events

Monitoring Well ID	Sample Date	1,1-DCE	1,1-DCA	1,1,1-TCA	TCE	1,4-Dioxane
ERT-2	October 1999	5 J	15	420	12	NA
	December 2000	21	12	220	7	NA
	June 2001	20.3	5.5	142	8.0	NA
	January 2002	38	20	358	16.0	NA
	August 2002	36	16	290	14.0	NA
	January 2003	34	10	202	13	NA
	July 2003	28	8	112	9	NA
	July 2004	14	6.2	41	4.7	4.1
	April 2005	25	21	180	2.8	4.8
	October 2005	12	12	150	8.4	21
	April 2006	8	2.3	28	2.5	2R
	October 2006	1.7	0.48J	7.5	1.4	2.1
	April 2007	14	3.2	62	3	NA
ERT-3	October 1999	11	2J	130	52	NA
	December 2000	99J	20	600	85	NA
	June 2001	47.6	9.0	328	70.4	NA
	January 2002	40	8.0	279	75	NA
	August 2002	42	9.4	250	73	NA
	January 2003	44	8	320	86	NA
	July 2003	60	11	389	79	NA
	July 2004	23	9.9	200	56	83
	April 2005	34	16	250	75	66
	April 2006	23	9.7	170	35	30
	October 2006	18	9.5	110	30	65J
	April 2007	24	10	140	28	NA
ERT-4	October 1999	490J	160	6400J	460J	NA
	December 2000	220	190J	3600	390J	NA
	June 2001	920	196	13,800	800	NA
	January 2002	1090	134	16,900	908	NA
	August 2002	1200	190	16,000	640	NA
	January 2003	539	107	7080	369	NA
	July 2003	402	68	5080	248	NA
	July 2004	600	130	9000	440	6.8
	April 2005	510	150	6500	320	24
	April 2006	350	160J	4700	170	12
	October 2006	270	120	3500	210	1000R
	April 2007	3.7	1.6	28	9.2	NA

NOTES:

This table provides a summary of historical groundwater monitoring well sampling results for the MRIP Site, for only the four primary chlorinated VOC contaminants of concern, as follows:

1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
1,1,1-TCA = 1,1,1-Trichloroethane
TCE = Trichloroethene

All data expressed in concentrations of micrograms per liter (ug/L) or parts per billion (ppb)

U = Non-detect compound
J = Estimated value
NS = Not Sampled
R = Rejected

*The analytical results from the samples collected in October 1999 are considered questionable due to soil and sediment loading in the well.

August 2002 samples collected by USEPA and analyzed at two laboratories.

Mohonk Road Industrial Plant Superfund Site
Monitored Natural Attenuation Data Summary

Analyte	Unit	ERT-1 10/18/2006 NORM	ERT-1 4/5/2007 NORM	ERT-2 4/14/2006 NORM	ERT-2 10/24/2006 NORM	ERT-2 4/17/2007 NORM	ERT-3 4/14/2006 NORM	ERT-3 10/26/2006 NORM	ERT-3 4/19/2007 NORM	ERT-4 4/17/2006 NORM	ERT-4 10/26/2006 NORM	ERT-4 4/16/2007 NORM	MW-1B 4/10/2006 NORM
Volatile Organics													
1,1,1-trichloroethane	ug/L	**170 J**	**240**	**28 J**	**7.5**	**62**	**170 J**	**110 J**	**140**	**4700 J**	**3500 J**	**28**	0.5 U
1,1,2-trichloroethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**8**	25 U	0.5 U	0.5 U
1,1-dichloroethane	ug/L	**17**	**53**	**2.3**	**0.48 J**	**3.2**	**9.7**	**9.5**	**10**	**160 J**	**120**	**1.6**	0.5 U
1,1-dichloroethene	ug/L	**36 J**	**44**	**8**	**1.7**	**14**	**23 J**	**18**	**24**	**350 J**	**270**	**3.7**	0.5 U
1,2-dichloroethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.24 J**	0.5 U	**6.9**	25 U	0.5 U	0.5 U
1,4-dioxane	ug/L	**8.6**	NR	20 U	**2.1**	NR	**49 J**	**65 J**	NR	**5.5 J**	1000 R	NR	20 R
benzene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	25 U	0.5 U	0.5 U
carbon tetrachloride	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.2 J**	0.5 U	0.5 U	25 U	0.5 U	0.5 U
chloroethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.64**	0.5 U	0.5 U	**28 J**	**26**	0.5 U	0.5 U
chloroform	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.16 J**	0.5 U	**2.6**	25 U	0.5 U	0.5 U
chloromethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U J	0.5 U	0.5 U	0.5 U	0.5 U	25 U	0.5 U J	0.5 U
cis-1,2-dichloroethene	ug/L	0.5 U	**2**	0.5 U	**0.6**	0.5 U	**2.2 J**	**1.7 J**	**1.7**	**3.3 J**	25 U	0.5 U	0.5 U
ethylbenzene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	25 U	0.5 U	0.5 U
m,p-xylene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	25 U	0.5 U	0.5 U
methyl tert-butyl ether	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.17 J**	**0.26 J**	0.5 U	**0.09 J**	25 U	0.5 U	0.5 U
methylene chloride	ug/L	0.5 U	0.5 U	1.4 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5.1 U	25 U	0.5 U	**0.99 J**
o-xylene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	25 U	0.5 U	0.5 U
tetrachloroethene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.05 J**	25 U	0.5 U	0.5 U
toluene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	25 U	0.5 U	0.5 U
trans-1,2-dichloroethene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.2 J**	25 U	0.5 U	0.5 U
trichloroethene	ug/L	**13**	**2**	**2.5**	**1.4**	**3**	**35 J**	**30 J**	**28**	**170 J**	**210**	**9.2**	0.5 U
vinyl chloride	ug/L	0.5 U	**0.53**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	25 U	0.5 U	0.5 U
Gases													
ethane	ug/L	12 U		12 U	12 U		12 U	12 U		12 U	12 U		12 U
ethene	ug/L	17 U		17 U	17 U		17 U	17 U		17 U	17 U		17 U
methane	ug/L	10 U		10 U	10 U		**50.4**	10 U		**2.4 J**	10 U		10 U
Wet Chemistry													
chloride	mg/L	**30.9**	**14**	**38.6**	**24.1**	**11**	**25.7**	**26.2**	**19**	**16.9**	**20.9**	**8.7**	**23.3**
nitrate as N	mg/L	**2.02**	**0.77**	**0.44 J**	**5.7**	**3.8**	0.27 UJ	**1.5**	**1.5**	**1.18**	**0.9**	0.05 U	**0.45**
nitrite as N	mg/L	0.08 U	0.05 U	0.08 UJ	0.08 U	0.05 U	0.08 UJ	0.08 U	0.05 U	0.08 U	0.08 U	**0.072**	0.08 U
sulfate as SO4	mg/L	**82.6**		**45.3**	**193**		**41.1**	**76.9**		**45.1**	**65.8**		**89.7**
carbon dioxide	mg/L	**237**		**228**	**187**		**262**	**268**		**298**	**327**		**403**
total alkalinity	mg/L	**237**	**240**	**231**	**194**	**200**	**277**	**276**	**260**	**314**	**342**	**100**	**373**
total organic carbon	mg/L	**1**	1 U	**0.9**	**1.3**	1 U	**1.2**	**1.2**	1 U	**1.8**	**2**	1 U	**1.6**
sulfide	mg/L	0.2 U	0.01 U	**0.48**	**0.64**	0.01 U	**0.64**	0.2 U	0.01 U	**0.64**	**0.32**	0.01 U	**0.8**
Purge Parameters													
color	Visual	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	**Cloudy**	Clear
conductivity	umhos/cm	**623**	**676**	**483**	**619**	**650**	**515**	**574**	**626**	**570**	**662**	**229**	**690**
dissolved oxygen	mg/L	**30.6**	**2.6**	**3.98**	**3.13**	**1.58**	**1.86**	**4.16**	**2.13**	**3.61**	**4.46**	**6**	**5.15**
ferrous iron	mg/L	**0.03**	**0.09**	**0.12**	**0.06**	**0.19**	**0.11**	**0.01**	**0.23**	**0.56**	**0.29**	**1.27**	**0.11**
flow rate	mL/min	**4800**	**110**	**100**	**100**	**110**	**100**	**100**	**100**	**150**	**100**	**100**	**100**
gallons purged	mL	NA	NA	**0.87**	**1.25**	**3.5**	**1.32**	**1.00**	**5.5**	**1.07**	**1.00**	**3**	**0.343**
odor	Olfactory	None	None	None	None	None	None	None	None	None	None	None	None
ORP	+/-10 MeV	**170**	**131.7**	**201.2**	**34.6**	**88.4**	**199.3**	**165.8**	**53.2**	**186.8**	**146.8**	**71.1**	**208.4**
pH	pH unit	**7.52**	**6.65**	**6.66**	**7.43**	**6.54**	**6.73**	**7.40**	**6.7**	**6.76**	**7.15**	**6.63**	**6.43**
temperature	degrees C	**12.88**	**18.08**	**11.97**	**11.24**	**9.39**	**11.9**	**11.48**	**10.68**	**13.89**	**13.07**	**7.57**	**13.71**
turbidity	NTU	**37**	**0.0**	**5.3**	**4.1**	**2.9**	**3.5**	**7.1**	**1.5**	**30.0**	**28**	**95**	**2.7**
water level	feet	NA	NA	**47.23**	**38.24**	**41.15**	**53.16**	**41.49**	**42.45**	**26.47**	**24.84**	**19.72**	**59.71**

COCs identified in ROD (EPA 2000)

Mohonk Road Industrial Plant Superfund Site
Monitored Natural Attenuation Data Summary

Analyte	Unit	MW-1B 10/18/2006 NORM	MW-1B 4/3/2007 NORM	MW-4 4/17/2006 NORM	MW-4 10/24/2006 NORM	MW-4 4/13/2007 NORM	MW-5B 4/13/2006 NORM	MW-5B 10/25/2006 NORM	MW-5B 4/16/2007 NORM	MW-5R 10/18/2006 NORM	MW-5R 4/5/2007 NORM	MW-6B 4/13/2006 NORM	MW-6B 10/25/2006 NORM
Volatile Organics													
1,1,1-trichloroethane	ug/L	0.5 U	0.5 U	**1500 J**	**1100 J**	**1,700**	**2500 J**	**880 J**	**2,600**	**230 J**	**130**	**14**	**11**
1,1,2-trichloroethane	ug/L	0.5 U	0.5 U	**3.6**	**5.6**	**2.9**	**4**	**2.1 J**	**3.3**	**0.56 J**	0.5 U	0.5 U	0.5 U
1,1-dichloroethane	ug/L	0.5 U	0.5 U	**31 J**	**43**	**34**	**28 J**	**8.7**	**27**	**15 J**	**33**	0.5 U	**0.28 J**
1,1-dichloroethene	ug/L	0.5 U	0.5 U	**240 J**	**120**	**210**	**280 J**	**110**	**420**	**61 J**	**47**	**2.6**	**1.5**
1,2-dichloroethane	ug/L	0.5 U	0.5 U	**3.8**	**4 J**	**3.5**	**3.7**	5 U	0.5 U	**0.55**	0.5 U	0.5 U	0.5 U
1,4-dioxane	ug/L	2 U	NR	**5.9**	**4**	NR	20 U	**3.1**	NR	NR	NR	20 U	20 R
benzene	ug/L	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
carbon tetrachloride	ug/L	0.5 U	0.5 U	0.5 U	5 U	0.5 U	**14**	**2 J**	**9.9**	0.5 U	0.5 U	0.5 U	0.5 U
chloroethane	ug/L	0.5 U	0.5 U	**2.4**	**4.3 J**	**3.3**	**2.3**	5 U	**3**	0.5 U	0.5 U	0.5 U	0.5 U
chloroform	ug/L	0.5 U	0.5 U	**1**	5 U	**1.1**	**2.2 J**	5 U	**2.3**	0.5 UJ	0.5 U	0.5 U	0.5 U
chloromethane	ug/L	0.5 U	0.5 U J	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U J	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-dichloroethene	ug/L	0.5 U	0.5 U	**7 J**	**10 J**	**9.1**	**2.9 J**	**1.5 J**	0.5 U	0.5 U	**1.1**	0.5 U	0.5 U
ethylbenzene	ug/L	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m,p-xylene	ug/L	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
methyl tert-butyl ether	ug/L	0.5 U	0.5 U	**0.44 J**	**1.9 J**	**1.3**	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
methylene chloride	ug/L	0.5 U	0.5 U	5.3 U	5 U	**2.1**	0.8 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
o-xylene	ug/L	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
tetrachloroethene	ug/L	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
toluene	ug/L	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,2-dichloroethene	ug/L	0.5 U	0.5 U	**0.21 J**	5 U	**0.82**	**0.1 J**	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trichloroethene	ug/L	0.5 U	0.5 U	**1000 J**	**1100 J**	**970**	**230 J**	**87**	**120**	**9.2 J**	**7**	0.5 U	0.5 U
vinyl chloride	ug/L	0.5 U	0.5 U	**0.53**	5 U	**0.98**	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Gases													
ethane	ug/L	12 U		12 U	12 U		12 U	12 U		12 U		12 U	12 U
ethene	ug/L	17 U		**15.7 J**	17 U		17 U	17 U		17 U		17 U	17 U
methane	ug/L	10 U		**758**	**461**		10 U	10 U		10 U		10 U	10 U
Wet Chemistry													
chloride	mg/L	**26.4**	**16**	**30.8**	**64.7**		**8.78**	**9.11**	**9.2**	**53.5**	**35**	**24.7**	**30.6**
nitrate as N	mg/L	**0.49**	**0.37**	0.1 U	**0.11**		**0.2**	**0.28**	**0.16**	**0.93**	**0.73**	**2.06**	**2.07**
nitrite as N	mg/L	0.08 U	0.05 U	0.08 U	0.08 U		0.08 U	0.08 U	0.05 U	0.08 U	0.05 U	0.08 U	0.08 U
sulfate as SO4	mg/L	**69.5**		**37.2**	**50.2**		**45.3**	**48.9**		**38.9**		**56.7**	**50.7**
carbon dioxide	mg/L	**414**		**461**	**520**		**280**	**287**		**225**		**262**	**284**
total alkalinity	mg/L	**355**	**370**	**461**	**509**		**286**	**283**	**270**	**225**	**230**	**280**	**296**
total organic carbon	mg/L	**2.3**	1 U	**2**	**1.9**		**0.9**	**1.1**	1 U	**1**	1 U	**0.8**	**1**
sulfide	mg/L	0.2 U	**0.011**	**0.8**	**0.64**		0.2 U	**0.8**	0.01 U	0.2 U	0.01 U	**0.48**	0.2 U
Purge Parameters													
color	Visual	Clear	Clear	Clear	Clear	**V. Lt Brown**	Clear	Clear	Clear	Clear	Clear	Clear	Clear
conductivity	umhos/cm	**836**	**816**	**739**	**968**	**941**	**569**	**522**	**481**	**589**	**535**	**594**	**598**
dissolved oxygen	mg/L	**2.79**	**1.83**	**2.17**	**0.23**	**4.64**	**6.04**	**7.15**	**2.97**	**4.01**	**2.21**	**3.75**	**4.39**
ferrous iron	mg/L	**0.09**	**0.17**	**0.42**	**0.05**	**3.3**	0.00	**0.03**	**0.16**	**0.05**	**0.08**	**0.21**	**0.04**
flow rate	mL/min	**100**	**100**	**100**	**160**	**100**	**150**	**100**	**110**	**4500**	**220**	**100**	**100**
gallons purged	mL	NA	NA	**1.19**	**2.9**	**7.5**	**0.277**	NA	**3.00**	NA	NA	**1.16**	**0.75**
odor	Olfactory	None	None	None	None	None	None	None	None	None	None	None	None
ORP	+/-10 MeV	**117.2**	**124.8**	**50.4**	**29.3**	**46.4**	**197.1**	**42.8**	**95.0**	**128.5**	**124.9**	**253.2**	**30.6**
pH	pH unit	**7.07**	**7.1**	**6.68**	**7.10**	**6.48**	**6.47**	**7.37**	**6.46**	**7.48**	**6.59**	**6.57**	**7.55**
temperature	degrees C	**15.03**	**16.6**	**11.84**	**16.10**	**13**	**17.7**	**12.87**	**9.66**	**12.21**	**13.34**	**16.03**	**13.17**
turbidity	NTU	**2.00**	**3.56**	**14.9**	**1.3**	**320**	**6.2**	0.00	**1.1**	**0.05**	**1.87**	**13.5**	**1.3**
water level	feet	**70.42**	**70.43**	**7.77**	**11.29**	**14.6**	**24.41**	**23.28**	**19.13**	NA	NA	**57.12**	**49.39**

COCs identified in ROD (EPA 2000)

Mohonk Road Industrial Plant Superfund Site
Monitored Natural Attenuation Data Summary

Analyte	Unit	MW-6B 4/10/2007 NORM	MW-7R 10/18/2006 NORM	MW-7R 4/5/2007 NORM	MW-8B 4/12/2006 NORM	MW-8B 10/20/2006 NORM	MW-8B 4/4/2007 NORM	MW-9 10/16/2006 NORM	MW-9 4/2/2007 NORM	MW-9B 4/11/2006 NORM	MW-9B 10/17/2006 NORM	MW-9B 4/3/2007 NORM	MW-10B 4/13/2006 NORM
Volatile Organics													
1,1,1-trichloroethane	ug/L	**17**	**250 J**	**250**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.46 J**	**0.47 J**	**0.7 J**	0.5 U
1,1,2-trichloroethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-dichloroethane	ug/L	0.5 U	**46 J**	**53**	0.5 U	**0.22 J**	0.5 U	0.5 U	0.5 U	**0.25 J**	**0.25 J**	0.5 U	0.5 U
1,1-dichloroethene	ug/L	**3.8**	**33 J**	**43**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-dichloroethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-dioxane	ug/L	NR	**3.9**	NR	20 R	2 U	NR	20 R	NR	20 R	2 U	NR	20 UJ
benzene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
carbon tetrachloride	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
chloroethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
chloroform	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
chloromethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U J	0.5 U	0.5 U J	0.5 U	0.5 U	0.5 U J	0.5 U
cis-1,2-dichloroethene	ug/L	0.5 U	**1.5 J**	**1.9**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ethylbenzene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m,p-xylene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
methyl tert-butyl ether	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
methylene chloride	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.6 J**	0.5 U	0.5 U	0.5 U
o-xylene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
tetrachloroethene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
toluene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,2-dichloroethene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trichloroethene	ug/L	0.5 U	**1.6**	**1.9**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
vinyl chloride	ug/L	0.5 U	0.5 U	**0.54**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Gases													
ethane	ug/L		12 U		120 U	120 U		12 U		12 U	12 U		12 U
ethene	ug/L		17 U		170 U	170 U		17 U		17 U	17 U		17 U
methane	ug/L		10 U		**6800**	**5420**		10 U		**3.3 J**	**10 U**		**2.6 J**
Wet Chemistry													
chloride	mg/L	**23**	**21.2**	**13**	**31.2**	**35**	**31**	**0.46**	1 U	**2.44**	**2.72**	**2.5**	**2.88**
nitrate as N	mg/L	**2**	**1.24**	**0.77**	0.1 U	0.1 U	0.05 U	**0.12**	**0.059**	0.1 U	0.1 U	0.05 U	0.1 U
nitrite as N	mg/L	0.05 U	0.08 U	0.05 U	0.08 U	0.08 U	0.05 U	0.08 U	0.05 U	0.08 U	0.08 U	0.05 U	0.08 U
sulfate as SO4	mg/L		**51**		**4.69**	**5.9**		**5.56**		**16.1**	**14**		**23.9**
carbon dioxide	mg/L		**231**		**219**	**230**		**98.6**		**137**	**144**		**122**
total alkalinity	mg/L	**290**	**231**	**240**	**241**	**254**	**260**	**109**	**110**	**149**	**151**	**150**	**122**
total organic carbon	mg/L	1 U	**1**	1 U	**0.6**	**0.7**	1 U	**0.6**	1 U	**0.2**	**0.6**	1 U	**0.4**
sulfide	mg/L	0.01 U	0.2 U	0.01 U	**0.8**	0.2 U	**0.89**	**0.32**	0.01 U	0.2 U	0.48	**0.032**	0.2 U
Purge Parameters													
color	Visual	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Cloudy	Clear
conductivity	umhos/cm	**618**	**545**	**553**	**470**	**498**	**466**	**207**	**150**	**245**	**284**	**259**	**252**
dissolved oxygen	mg/L	**3.49**	**3.15**	**3.41**	**0.99**	**0.71**	**0.34**	**1.10**	**0.98**	**1.51**	**1.30**	**0.58**	**3.88**
ferrous iron	mg/L	**0.12**	**0.04**	**0.1**	**0.64**	**0.53**	**0.33**	**0.25**	**0.05**	**0.18**	**0.43**	**0.97**	**0.18**
flow rate	mL/min	**110**	**2400**	**220**	**150**	**100**	**120**	**80**	**100**	**200**	**100**	**100**	**100**
gallons purged	mL	**3.75**	NA	NA	**1.19**	NA	**4.00**	**2.75**	**2**	**1.24**	2.5	**5.25**	**0.924**
odor	Olfactory	None	None	None	Faint Sulfur	Sulfur	Sulfur	None	None	None	None	None	None
ORP	+/-10 MeV	**98.3**	**155.4**	**127.9**	-135.0	-188.6	-194.7	-6.7	175.2	**11.6**	-6.9	-52.0	**111.0**
pH	pH unit	**6.77**	**7.48**	**6.68**	**7.28**	**7.55**	**8.41**	**7.93**	**7.89**	**7.32**	**7.87**	**7.89**	**6.72**
temperature	degrees C	**12.65**	**12.64**	**16.23**	**14.92**	**11.91**	**9.2**	**11.87**	**10.08**	**10.51**	**10.18**	**10.21**	**13.60**
turbidity	NTU	**1.04**	**2.1**	0.00	**6.47**	**3.2**	**6.69**	**3.26**	**2.79**	**5.57**	**7.70**	**27.1**	**2.63**
water level	feet	**76.63**	NA	NA	**33.65**	**32.51**	**31.25**	**24.53**	**22.04**	**29.7**	**30.05**	**29.53**	**27.04**

COCs identified in ROD (EPA 2000)

Mohonk Road Industrial Plant Superfund Site
Monitored Natural Attenuation Data Summary

Analyte	Unit	MW-10B 10/19/2006 NORM	MW-10B 4/4/2007 NORM	MW-11B 10/23/2006 NORM	MW-11B 4/11/2007 NORM	MW-11C 10/23/2006 NORM	MW-11C 4/11/2007 NORM	MW-12B 10/27/2006 NORM	MW-12B 4/10/2007 NORM	MW-13B 4/11/2006 NORM	MW-13B 10/25/2006 NORM	MW-13B 4/13/2007 NORM	MW-14B 4/11/2006 NORM
Volatile Organics													
1,1,1-trichloroethane	ug/L	0.5 U	0.5 U	**40 J**	**24**	**16**	**19**	**76 J**	**72**	0.5 R	0.5 U	0.5 U	0.5 U
1,1,2-trichloroethane	ug/L	0.5 U	0.5 U	**0.22 J**	0.5 U	0.5 U	0.5 U	**0.48 J**	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
1,1-dichloroethane	ug/L	0.5 U	0.5 U	**7.1**	**5.4**	**3**	**5**	**31 J**	**29**	0.5 R	0.5 U	0.5 U	**0.67**
1,1-dichloroethene	ug/L	0.5 U	0.5 U	**18 J**	**17**	**11**	**18**	**47 J**	**56**	0.5 R	0.5 U	0.5 U	0.5 U
1,2-dichloroethane	ug/L	0.5 U	0.5 U	**0.22 J**	0.5 U	0.5 U	0.5 U	**0.45 J**	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
1,4-dioxane	ug/L	2 U	NR	20 R	NR	20 R	NR	**31 J**	NR	20 R	2 U	NR	20 R
benzene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
carbon tetrachloride	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
chloroethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
chloroform	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.17 J**	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
chloromethane	ug/L	0.5 U	0.5 U J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
cis-1,2-dichloroethene	ug/L	0.5 U	0.5 U	**0.12 J**	0.5 U	0.5 U	0.5 U	**0.34 J**	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
ethylbenzene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
m,p-xylene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
methyl tert-butyl ether	ug/L	0.5 U	0.5 U	**0.21 J**	0.5 U	**0.19 J**	0.5 U	**0.44 J**	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
methylene chloride	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.93 J**	0.5 U	0.5 U	**0.54 J**
o-xylene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
tetrachloroethene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
toluene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
trans-1,2-dichloroethene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
trichloroethene	ug/L	0.5 U	0.5 U	**6.4**	**3.5**	**2.4**	**3.3**	**14**	**13**	0.5 R	0.5 U	**1.1**	0.5 U
vinyl chloride	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 R	0.5 U	0.5 U	0.5 U
Gases													
ethane	ug/L	12 U		12 U		12 U		12 U		12 U	12 U		12 U
ethene	ug/L	17 U		17 U		17 U		17 U		17 U	17 U		17 U
methane	ug/L	10 U		10 U		10 U		10 U		**15.3**	**15.6**		**19.8**
Wet Chemistry													
chloride	mg/L	**3.5**	**2**	**22.8**	**11**	**81.1**	**44**	**21.9**	**15**	**18.6**	**20.1**	**16**	**51.7**
nitrate as N	mg/L	**0.19**	0.05 U	**0.17**	0.05 U	**0.54**	**0.29**	**0.63**	**0.48**	0.1 U	0.1 U	0.05 U	0.1 U
nitrite as N	mg/L	0.08 U	0.05 U	0.08 U	0.05 U	0.08 U	0.05 U	0.08 U	0.05 U	0.08 U	0.08 U	0.05 U	0.08 U
sulfate as SO4	mg/L	**37.8**		**21.1**		**30.6**		**33**		**39.9**	**36.1**		**19.1**
carbon dioxide	mg/L	**98.6**		**166**		**216**		**210**		**104**	**111**		**108**
total alkalinity	mg/L	**77**	**110**	**175**	**200**	**220**	**200**	**208**	**210**	**111**	**115**	**110**	**115**
total organic carbon	mg/L	**0.7**	1 U	**1.7**	1 U	**0.8**	1 U	**1**	1 U	**0.4**	**0.9**	1 U	**0.6**
sulfide	mg/L	**0.32**	0.01 U	**0.96**	0.01 U	**0.64**	0.01 U	**0.8**	0.01 U	**0.96**	**0.48**	0.01 U	**0.96**
Purge Parameters													
color	Visual	Clear	Clear	Clear	Brown	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
conductivity	umhos/cm	**242**	**214**	**345**	**414**	**569**	**486**	**424**	**388**	**267**	**275**	**-71.8**	**386**
dissolved oxygen	mg/L	**3.61**	**0.72**	**1.69**	**0.46**	**2.42**	**2.17**	**1.78**	**1.3**	**3.95**	**0.35**	**0.06**	**1.43**
ferrous iron	mg/L	**0.12**	**0.09**	**2.43**	**3.3**	**0.06**	**0.23**	**0.08**	**0.16**	**1.64**	**1.54**	**1.73**	**2.13**
flow rate	mL/min	**100**	**120**	**100**	**100**	**100**	**100**	**100**	**120**	NA	NA	100	**150**
gallons purged	mL	NA	2.00	NA	5.5	**1.5**	**3.25**	**1.25**	**3.00**	NA	NA	NA	**1.66**
odor	Olfactory	None	None	None	None	None	None	None	None	None	None	None	None
ORP	+/-10 MeV	-95.7	139.0	-101.4	-102.5	**29.2**	**106.6**	**130.2**	**125.8**	-36.9	-153.9	0.281	**18.6**
pH	pH unit	**11.42**	**7.04**	**7.54**	**6.86**	**7.30**	**6.51**	**7.20**	**6.2**	**7.30**	**7.86**	**6.72**	**6.42**
temperature	degrees C	**14.93**	**6.97**	**11.73**	**11.89**	**12.01**	**10.8**	**12.56**	**7.99**	**10.63**	**11.09**	**9.89**	**17.29**
turbidity	NTU	**0.75**	**2.13**	**36**	**148.0**	**5.1**	**8.11**	**7.0**	**6.88**	**0.83**	0.00	2.1	**7.41**
water level	feet	**28.82**	**25.59**	**14.81**	**31.33**	**17.11**	**34.21**	**9.06**	**10.25**	Artesian	Artesian	Artesian	**12.34**

COCs identified in ROD (EPA 2000)

Mohonk Road Industrial Plant Superfund Site
Monitored Natural Attenuation Data Summary

Analyte	Unit	MW-14B 10/19/2006 NORM	MW-14B 4/6/2007 NORM	MW-15B 10/30/2006 NORM	MW-15B 4/18/2007 NORM	MW-16 10/27/2006 NORM	MW-16 4/17/2007 NORM	MW-17-1 4/18/2006 NORM	MW-17-1 10/17/2006 NORM	MW-17-1 4/20/2007 NORM	MW-17-2 4/18/2006 NORM	MW-17-2 10/17/2006 NORM	MW-17-2 4/20/2007 NORM
Volatile Organics													
1,1,1-trichloroethane	ug/L	0.5 U	0.5 U	**180 J**	**200**	**140 J**	**2.9**	**70 J**	**79 J**	**80**	**100 J**	**73 J**	**79**
1,1,2-trichloroethane	ug/L	0.5 U	0.5 U	**0.44 J**	0.5 U	**0.84 J**	0.5 U	0.5 U	**0.46 J**	0.5 U	0.5 U	**0.39 J**	0.5 U
1,1-dichloroethane	ug/L	**0.72**	**0.82**	**25**	**30**	**25**	0.5 U	**16**	**16**	**16**	**15**	**18**	**16**
1,1-dichloroethene	ug/L	0.5 U	0.5 U	**38**	**60**	**60 J**	**1.7**	**30 J**	**38 J**	**58**	**50 J**	**37 J**	**50**
1,2-dichloroethane	ug/L	0.5 U	0.5 U	1 U	0.5 U	**0.71 J**	0.5 U	0.5 U	**0.38 J**	0.5 U	0.5 U	**0.36 J**	0.5 U
1,4-dioxane	ug/L	2 U	NR	40 R	NR	40 R	NR	**8.4**	20 R	NR	20 U	20 R	NR
benzene	ug/L	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
carbon tetrachloride	ug/L	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
chloroethane	ug/L	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	**0.56**	0.5 U	**0.58**	0.5 U	0.5 U	0.5 U
chloroform	ug/L	0.5 U	0.5 U	1 U	0.5 U	**0.29 J**	0.5 U	0.5 U	**0.21 J**	0.5 U	0.5 U	**0.18 J**	0.5 U
chloromethane	ug/L	0.5 U	0.5 U	1 U	0.5 U J	1 U	0.5 U J	0.5 U	0.5 U	0.5 U	**0.12 J**	0.5 U	0.5 U
cis-1,2-dichloroethene	ug/L	0.5 U	0.5 U	1 U	0.5 U	**0.3 J**	0.5 U	**0.77 J**	**0.74 J**	**0.69**	**1.4 J**	**1.7 J**	**1.7**
ethylbenzene	ug/L	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
m,p-xylene	ug/L	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
methyl tert-butyl ether	ug/L	**0.2 J**	0.5 U	1 U	0.5 U	1 U	0.5 U	**0.34 J**	**0.39 J**	0.5 U	**0.24 J**	**0.41 J**	0.5 U
methylene chloride	ug/L	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	4.5 U	0.5 U	0.5 U	1.9 U	0.5 U	0.5 U
o-xylene	ug/L	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
tetrachloroethene	ug/L	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
toluene	ug/L	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
trans-1,2-dichloroethene	ug/L	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trichloroethene	ug/L	0.5 U	0.5 U	**3.1**	**3.9**	**12**	0.5 U	**7.6**	**7.9**	**8.4**	**4.5 J**	**5.8**	**5.4**
vinyl chloride	ug/L	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Gases													0.5 U
ethane	ug/L	12 U		12 U		12 U		12 U	12 U		12 U	12 U	0.5 U
ethene	ug/L	17 U		17 U		17 U		17 U	17 U		17 U	17 U	0.5 U
methane	ug/L	**78.6**		10 U		10 U		**14.7**	10 U		**2.5 J**	10 U	0.5 U
Wet Chemistry													
chloride	mg/L	**51.8**	**38**	**8.83**	**6.8**	**8.13**	**1.5**	**24.6**	**21.6**	**19**	**21.8**	**23.2**	**20**
nitrate as N	mg/L	0.1 U	0.05 U	**0.18**	**0.13**	**0.46**	**0.46**	**1 J**	**0.97**	**0.88**	**0.9 J**	**0.8**	**0.76**
nitrite as N	mg/L	0.08 U	0.05 U	0.08 U	0.05 U	0.08 U	0.05 U	0.08 U	0.08 U	0.05 U	0.08 U	0.08 U	0.05 U
sulfate as SO4	mg/L	**17**		**26.3**		**23.1**		**30.5**	**29.5**		**31.3**	**28.9**	
carbon dioxide	mg/L	**152**		**214**		**153**		**191**	**197**		**182**	**201**	
total alkalinity	mg/L	**121**	**130**	**210**	**210**	**123**	**61**	**195**	**203**	**210**	**193**	**201**	**210**
total organic carbon	mg/L	**0.9**	1 U	**0.9**	1 U	**1.4**	1 U	**0.8**	**1**	1 U	**0.7**	**1**	1 U
sulfide	mg/L	**0.32**	0.01 U	**0.8**	0.01 U	**0.48**	**0.016**	**0.64**	0.2 U	0.01 U	**0.96**	0.2 U	0.01 U
Purge Parameters													
color	Visual	Clear	Clear	Clear	Clear	Yellowish	Cloudy		Clear	Clear		Clear	Clear
conductivity	umhos/cm	**380**	**324**	**412**	**385**	**242**	**122**	**396**	**463**	**427**	**396**	**453**	**416**
dissolved oxygen	mg/L	**0.64**	**0.4**	**2.06**	**9.6**	**1.55**	**3.51**		NA	2.47		NA	1.45
ferrous iron	mg/L	**2.66**	**2.77**	**0.26**	**0.31**	**0.24**	**0.66**	**0.04**	**0.05**	**0.19**	**0.2**	**0.28**	**0.37**
flow rate	mL/min	**100**	**100**	**100**	**100**	**100**	**100**						
gallons purged	mL	**4.5**	**7.75**	**1.0**	**2.75**	NA	2.25						
odor	Olfactory	None	None	None	None	Decomp	Decomp	No	None	None	No	None	None
ORP	+/-10 MeV	-20.0	-2.9	**116.2**	**77.3**	**114.3**	**128.1**	**12.9**	NA	124.8	**59.9**	NA	130
pH	pH unit	**6.47**	**6.32**	**7.47**	**6.62**	**6.86**	**5.6**	**6.89**	**7.85**	**6.9**	**7.7**	**7.65**	**6.94**
temperature	degrees C	**14.74**	**8.75**	**11.94**	**9.57**	**9.66**	**8.65**	**11.42**	**11.09**	**11.38**	**11.82**	**10.93**	**11.26**
turbidity	NTU	**2.9**	**7.43**	**31**	**10**	**11**	**34**	**1.7**	0.00	0.35	**29**	**16.9**	**4.5**
water level	feet	**15.46**	**10.49**	**16.89**	**16.61**	**24.61**	**19.33**						

COCs identified in ROD (EPA 2000)

Mohonk Road Industrial Plant Superfund Site
Monitored Natural Attenuation Data Summary

Analyte	Unit	MW-17-3 4/18/2006 NORM	MW-17-3 10/17/2006 NORM	MW-17-3 4/20/2007 NORM	MW-18-1 4/12/2006 NORM	MW-18-1 11/1/2006 NORM	MW-18-1 4/19/2007 NORM	MW-18-2 4/12/2006 NORM	MW-18-2 11/1/2006 NORM	MW-18-2 4/19/2007 NORM	MW-18-3 4/12/2006 NORM	MW-18-3 11/1/2006 NORM	MW-18-3 4/19/2007 NORM
Volatile Organics													
1,1,1-trichloroethane	ug/L	**63 J**	**65 J**	**73**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-trichloroethane	ug/L	**0.29 J**	**0.34 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-dichloroethane	ug/L	**16 J**	**19**	**17**	**0.32 J**	**0.3 J**	0.5 U	**0.19 J**	**0.19 J**	0.5 U	**0.27 J**	**0.39 J**	0.5 U
1,1-dichloroethene	ug/L	**36 J**	**35 J**	**49**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-dichloroethane	ug/L	0.5 U	**0.34 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-dioxane	ug/L	20 U	20 R	NR	20 R	2 U	NR	20 R	2 U	NR	20 R	2 U	NR
benzene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
carbon tetrachloride	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
chloroethane	ug/L	**0.92**	**1.6**	**0.73**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
chloroform	ug/L	**0.16 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
chloromethane	ug/L	**0.09 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-dichloroethene	ug/L	**5.7 J**	**5.8 J**	**5.8**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ethylbenzene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m,p-xylene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
methyl tert-butyl ether	ug/L	**0.29 J**	**0.43 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
methylene chloride	ug/L	1.3 U	0.5 U	0.5 U	**1.5 J**	0.5 U	0.5 U	**0.86 J**	0.5 U	0.5 U	**0.81 J**	0.5 U	0.5 U
o-xylene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
tetrachloroethene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
toluene	ug/L	**2.4**	**2.1**	**1.6**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,2-dichloroethene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trichloroethene	ug/L	**0.6**	**0.74**	**0.6**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
vinyl chloride	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Gases													
ethane	ug/L	12 U	12 U		12 U	12 U		**7 J**	12 U		12 U	12 U	
ethene	ug/L	17 U	17 U		17 U	17 U		17 U	17 U		17 U	17 U	
methane	ug/L	**42.2**	**20.5**		**63.9**	**33.1**		**138**	**70.6**		**299**	**162**	
Wet Chemistry													
chloride	mg/L	**22.4**	**23.6**	**19**	**47.2**	**45**	**39**	**54.2**	**50.7**	**43**	**52.8**	**51.9**	**43**
nitrate as N	mg/L	0.1 U	**0.73**	**0.6**	0.1 U	0.1 U	0.05 U	0.1 U	0.1 U	0.05 U	0.1 U	0.1 U	0.05 U
nitrite as N	mg/L	**0.84 J**	0.08 U	**0.095**	0.08 U	0.08 U	0.05 U	0.08 U	0.08 U	0.05 U	0.08 U	0.08 U	0.05 U
sulfate as SO4	mg/L	**31.2**	**27.8**		**13.4**	**14.5**		**15.1**	**12.7**		**11.2**	**12.8**	
carbon dioxide	mg/L	**192**	**201**		**134**	**144**		**124**	**149**		**127**	**137**	
total alkalinity	mg/L	**199**	**207**	**210**	**144**	**143**	**150**	**133**	**143**	**140**	**135**	**143**	**150**
total organic carbon	mg/L	**2.8**	**4.1**	1 U	**0.6**	**1.5**	1 U	**0.5**	**1**	1 U	**2**	**2.4**	**2**
sulfide	mg/L	**0.96**	0.2 U	**0.024**	**0.8**	0.2 U	**0.067**	**0.32**	**0.64**	**2.4**	**0.96**	**0.96**	**2.3**
Purge Parameters													
color	Visual		Greyish	Clear		Clear	Clear		Clear	Clear		Clear	Clear
conductivity	umhos/cm	**393**	**461**	**426**	**345**	**348**	**356**	**353**	**358**	**366**	**352**	**359**	**382**
dissolved oxygen	mg/L		NA	0.91		**1.44**	**1.32**		**1.35**	**1.62**		**1.16**	**0.88**
ferrous iron	mg/L	**0.02**	**0.43**	**0.51**	**0.029**	**0.3**	**0.4**	**0.08**	**0.08**	**0.2**	**0.11**	**0.15**	**0.22**
flow rate	mL/min												
gallons purged	mL												
odor	Olfactory	Yes	Sulfur	Sulfur	Yes	Sulfur	Sulfur	Yes	Sulfur	Sulfur	Yes	Sulfur	Sulfur
ORP	+/-10 MeV	**13.5**	NA	1.4	-79.1	-33.0	-115.7	-109.3	-55.6	-129.9	-116.5	-61.0	-148.1
pH	pH unit	**6.93**	**7.58**	**6.83**	**7.49**	**7.72**	**7.44**	**7.35**	**7.72**	**7.34**	**7.29**	**7.76**	**7.46**
temperature	degrees C	**11.73**	**10.96**	**11.48**	**11.23**	**10.85**	**10.77**	**11.72**	**11.04**	**10.72**	**11.63**	**11.01**	**11.34**
turbidity	NTU	**5.3**	**0.11**	**1.2**	**1.46**	0.0	0.25	**2.48**	0.0	0.25	**1.64**	0.0	0.3
water level	feet												

COCs identified in ROD (EPA 2000)

Mohonk Road Industrial Plant Superfund Site
Monitored Natural Attenuation Data Summary

Analyte	Unit	MW-19-1 10/31/2006 NORM	MW-19-1 4/13/2007 NORM	MW-19-2 10/31/2006 NORM	MW-19-2 4/13/2007 NORM	MW-19-3 10/31/2006 NORM	MW-19-3 4/13/2007 NORM	MW-20-1 11/1/2006 NORM	MW-20-1 4/18/2007 NORM	MW-20-2 11/1/2006 NORM	MW-20-2 4/18/2007 NORM	MW-20-3 11/1/2006 NORM	MW-20-3 4/18/2007 NORM
Volatile Organics													
1,1,1-trichloroethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-trichloroethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-dichloroethane	ug/L	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-dichloroethene	ug/L	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-dichloroethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-dioxane	ug/L	20 R	NR	20 R	NR	20 R	NR	20 R	NR	20 R	NR	20 R	NR
benzene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
carbon tetrachloride	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
chloroethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
chloroform	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
chloromethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U J	0.5 U	0.5 U J	0.5 U	0.5 U J
cis-1,2-dichloroethene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ethylbenzene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m,p-xylene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
methyl tert-butyl ether	ug/L	**0.24 J**	0.5 U	**0.32 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
methylene chloride	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
o-xylene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
tetrachloroethene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
toluene	ug/L	**0.66**	0.5 U	**1.8**	**2.1**	**2**	**2.8**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,2-dichloroethene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trichloroethene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
vinyl chloride	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Gases													
ethane	ug/L	12 U		120 U		120 U		12 U		12 U		12 U	
ethene	ug/L	17 U		170 U		170 U		17 U		17 U		17 U	
methane	ug/L	**617**		**2220**		**3620**		**216**		**351**		**210**	
Wet Chemistry													
chloride	mg/L	**180**	**170**	**50.4**	**46**	**50.1**	**47**	**123**	**28**	**318**	**270**	**171**	**85**
nitrate as N	mg/L	**0.33**	**0.45**	0.1 U	0.05 U	0.1 U	**0.064**	0.1 U	**0.34**	0.1 U	0.05 U	0.1 U	0.05 U
nitrite as N	mg/L	0.08 U	0.05 U	0.08 U	0.05 U	0.08 U	0.05 U	0.08 U	0.05 U	0.08 U	0.05 U	0.08 U	0.05 U
sulfate as SO4	mg/L	**30.3**		**4.41**		0.5 U		**331**		**652**		**254**	
carbon dioxide	mg/L	**238**		**180**		**186**		**162**		**188**		**183**	
total alkalinity	mg/L	**214**	**230**	**179**	**160**	**211**	**220**	**155**	**180**	**188**	**180**	**180**	**190**
total organic carbon	mg/L	**2.6**	1 U	**1.6**	1 U	**1.2**	1 U	**1**	1 U	**1**	1 U	**1.1**	1 U
sulfide	mg/L	**0.32**	0.01 U	**0.48**	**0.017**	**0.48**	**0.32**	**0.32**	0.01 U	0.2 U	0.01 U	0.2 U	**0.36**
Purge Parameters													
color	Visual	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
conductivity	umhos/cm	**863**	**853**	**448**	**397**	**482**	**451**	**1005**	**509**	**1746**	**1720**	**1057**	748
dissolved oxygen	mg/L	**1.48**	**0.85**	**0.83**	**4**	**0.91**	**0.44**	**1.26**	**3.2**	**1.44**	**1.28**	**1.75**	0.66
ferrous iron	mg/L	**3.29**	**2.56**	**1.61**	**3.3**	**0.19**	**0.26**	**0.15**	**0.18**	**0.24**	**0.35**	**0.29**	0.65
flow rate	mL/min												
gallons purged	mL												
odor	Olfactory	None	Sulfur	None	Sulfur	None	Sulfur	Methane	Sulfur	Methane	Sulfur	Methane	Sulfur
ORP	+/-10 MeV	-42.3	-39.9	-86.9	-86.8	-139.9	-187.9	**15**	**-91**	**38.8**	**-44.2**	-11.6	-136.8
pH	pH unit	**8.18**	**6.46**	**8.11**	**6.71**	**9.38**	**8.9**	**7.68**	**7.6**	**7.55**	**7.24**	**7.81**	7.54
temperature	degrees C	**12.53**	**10.62**	**12.34**	**10.73**	**12.12**	**10.67**	**11.17**	**10.75**	**11.14**	**10.86**	**11.23**	10.8
turbidity	NTU	**6.86**	**5.4**	**1.1**	**0.55**	**7.3**	**8.6**	0.0	0.7	0.0	1	0.0	1.1
water level	feet												

COCs identified in ROD (EPA 2000)

Attachment 2

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Technical Memorandum #1

DRAFT

To: CENWK-EC-ED (Robert Pender)
U.S. Army Engineer District, Kansas City

CC: Patrick Hamblin, Remedial Project Manager
U.S. Environmental Protection Agency

Date: 21 August 2001

Subject: Contract DACW41-99-9005
Mohonk Road Industrial Plant Superfund Site Remedial Design
Task Order 005, Modification 02, Work Authorization Directive (WAD) 01
Work Element 5.03
Historical Groundwater Elevation and Contaminant Plume Assessment

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1 Objective

This document presents an assessment of the hydrogeologic and environmental conditions of the Mohonk Road Industrial Plant (MRIP) Superfund Site. Ecology and Environment Engineering, P.C. (E & E) reviewed and evaluated existing data as part of the pre-design analysis for the Farfield Plume groundwater treatment system. Data reviewed for this analysis include previous site documents including the Remedial Investigation (RI) and Feasibility Study (FS) reports, technical memoranda, Nearfield Plume treatment system operational data, and electronic files summarizing monitoring and residential well water levels and sampling results. The U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (USEPA) provided data to E & E.

2 Site Background and Setting

2.1 Site History and Description

The MRIP site is located in the Hamlet of High Falls, towns of Marbletown and Rosendale, Ulster County, New York. The site was added to the National Priorities List (NPL) in January 1999 in response to groundwater contaminated with chlorinated solvents and its impact on residential water supplies. An RI/FS was completed in 1999 (LMS 1998; 1999). Since groundwater is the primary drinking water source for High Falls, USEPA has proposed to provide an alternative, clean drinking water source, and treat the contaminated groundwater.

The MRIP site consists of 14.5 acres of mostly undeveloped land with a 43,000 square foot building in its southern corner. A small woodworking company now occupies the

northeast section of the building. The MRIP site was formerly the location of a metal finisher, a wet spray painting company, and a manufacturer of store display fixtures, all or some of which used organic solvents in their processes. The site is hydraulically upgradient of numerous domestic groundwater wells, many of which are contaminated with chlorinated solvents. According to the RI report (1998), at least 71 residential, commercial, and/or municipal water supply wells have been impacted. There are 159 households and 412 people residing within a 1-mile radius of the MRIP site. The site occupies a topographic high point at an approximate elevation of 340 feet above sea level. Most of High Falls lies below 180 feet above sea level (USGS 1964).

2.2 Geologic Setting

The geologic setting of the MRIP site is summarized in the *Work Plan for Groundwater Treatment System and Backup Municipal Water Supply Pre-Design Analysis* (E & E 2001) and described in the RI report by Lawler, Matusky & Skelly (LMS 1998). Additional detailed information can be found in *Hydrogeology of the Northern Shawangunk Mountains, Ulster County, New York* by Coates et al. (1994). A summary of this information is provided here in order to provide a basis for the understanding of the hydrogeologic conceptual model discussed below.

The MRIP site is in the northern Shawangunk Mountains and is underlain by the Shawangunk formation. This bedrock unit consists of Middle Silurian, white to light gray, interbedded orthoquartzitic conglomerates, sandstones, siltstones, with lenses of red and green shales. The Shawangunk formation is divided into three members. The Upper and Lower Members consist of interbedded, orthoquartzitic, conglomeritic sandstone. The Upper Member is distinguished by an abundance of rose quartz and dominates the hydrogeology of the site and contaminant plume. The Upper and Lower Members are separated by a gray to red to green sandstone, siltstone, and shale. Laterally discontinuous shale layers were identified in several monitoring wells in the vicinity of the site. Orthoquartzite is a sedimentary rock composed primarily of quartz sand and gravel that has undergone low-grade metamorphism. Exposure to high temperature and pressure dissolved silica from the grains of the rock and mobilized it in the pore spaces. Relief from these conditions caused the dissolved quartz to precipitate in the pore spaces securely cementing the grains together. In the Shawangunk formation, nearly all pore spaces are completely cemented by quartz creating a very hard rock and leaving essentially no primary porosity within the rock.

The thickness of the Shawangunk formation ranges from 140 to 350 feet and may be thicker outside of the study area. The deepest monitoring wells near the site are approximately 200 feet deep (minimum elevation of 22 feet above mean sea level) and terminate in Shawangunk orthoquartzite. The Shawangunk formation unconformably overlies the Upper and Middle Ordovician Martinsburg formation, a thick sequence of interbedded shales and sandstones. In areas, particularly east of Coxing Kill and the Wallkill River valley, the older Martinsburg formation has been thrust-faulted over the younger Shawangunk formation. Minor exposures of Late Silurian/Early Devonian sandstones, shales, and carbonates are also present at the northernmost end of the Shawangunk Mountains. These younger rocks are primarily found west of the Rondout

Creek valley lying unconformably over the Shawangunk formation, but may also be found beneath the older Shawangunk formation in areas of thrust faulting.

Six distinct sets of structural features have been identified within the Shawangunk formation. These include two types of thrust faults, strike-slip faults, step fracture cleavage associated with strike-slip faults, joints, and bedding discontinuities. With respect to the hydrogeologic setting of the site, the most important fracture types are joints and bedding plane discontinuities. In the vicinity of the site, the structural domain of the bedrock is dominated by folding, not faulting. A series of gently plunging open folds trend northeast. The four major drainage basins within the Shawangunks, including the Coxing Kill, are formed within the synclines of these folds. The MRIP site is located along the crest of the anticline adjacent to the Coxing Kill syncline. Associated with these folds is a set of pervasive, nearly vertical, northeast-southwest trending joints parallel to the fold axis. These joints are most commonly associated with extension along anticlinal fold axes and may extend continuously from several tens to thousands of feet. Where present, these joints intercept fractures of other orientations. The joints also intercept nearly horizontal bedding plane fractures. These fractures are associated with the release of pressure caused by glacial unloading. The competence of the Shawangunk formation has led to the extensive development of these rebound fractures. Sizable openings of similar rocks have been shown to extend to depths of over 100 feet but are probably not important below 200 feet due to pressure from the overlying rock mass (Coates et al. 1994).

Soils in the region are primarily derived from glacial sediment deposited during the most recent ice age (Wisconsinan Stage, approximately 15,000 years ago). These soils were deposited as lodgment till in direct contact with ice and are generally thin (4 feet or less) throughout the region. However, near the site, till up to approximately 85 feet thick was encountered (LMS 1998). Lodgment till is an unsorted (well-graded) mixture of silt and fine sand with coarse clasts of gravel, cobbles, and boulders. These clasts are generally of local origin (orthoquartzite). The till is highly compacted and does not transmit water readily. Other soil deposits do exist in the region including stratified glacial drift in the deeper valleys such as Rondout Creek and alluvium along creek banks. However, till dominates in the vicinity of the site.

3 Data Review and Presentation

3.1 Data Review Summary

All information available to E & E was reviewed for consistent sets of groundwater hydraulic and analytical data. Since the bedrock aquifer is the primary water source of potable water in the High Falls area, the focus was on data pertaining to bedrock monitoring wells. Electronic and hardcopy files were reviewed individually concurrently with creation of the Geographic Information System (GIS) database for the site. Therefore, data gaps identified below may be able to be filled later pending completion and review of the GIS database. As a result of the data review, six relatively consistent data sets were compiled, beginning in December 1997 and ending in May 2001. These data sets were compiled based on the completeness of the available data and the value of the data to evaluating hydrogeologic conditions before and after start-up of the Nearfield

Plume treatment system, as well as seasonal conditions. Information pertaining to the "key" wells consistently used to compile the six data sets is summarized in Table 1. These wells are subdivided into groups including 12 monitoring wells, three Nearfield Plume extraction wells, and up to eighty-two residential wells:

- The group of 12 monitoring wells consists of four Nearfield Plume and eight Farfield Plume bedrock wells that range in depth from 34 to 200 feet below ground surface (bgs).

    - The four Nearfield Plume monitoring wells (MW-1B, MW-5B, MW-6B and MW-7B) were drilled as 6-inch diameter open-hole bedrock wells in 1997 using NX coring methods (LMS 1997). Each of these wells was drilled to 100 feet bgs except for MW-5B (34 feet bgs), where a significant water-producing zone was encountered during drilling from 29 to 34 feet bgs. Bedrock was encountered near the site at depths ranging from 9 to 28 feet bgs, averaging 16 feet bgs.

    - The eight Farfield Plume monitoring wells (MW-8B through MW-15B) were installed downgradient of the site in 1997 and 1998 (LMS 1998). Originally proposed to be 100 feet deep, several of these wells were drilled deeper (maximum of 200 feet bgs) due to a lack of water-producing fractures. These wells were drilled as 6-inch diameter open-hole bedrock wells using air rotary drilling techniques. Bedrock was encountered at depths ranging from 7 to 85 feet bgs, with depths generally increasing with distance from the site, but not in a predictable trend.

- Two extraction wells (MW-5R and MW-7R) were installed for treatment of contaminated groundwater from the Nearfield Plume in 1998. Both wells were drilled adjacent to their bedrock-well counterparts (MW-5B and MW-7B) and completed as 6-inch diameter open-hole bedrock wells. Extraction well MW-5R was drilled to 125 feet bgs, with a water producing fracture zone detected 90 to 92 feet bgs and an approximate yield of 50 gallons per minute (gpm). Extraction well MW-7R was drilled to 180 feet bgs, with water producing fracture zones at 77, 145, and 159 feet bgs and an approximate yield of 18 to 20 gpm. Four additional potential extraction wells were drilled for the treatment of the Nearfield Plume in 1999 (ERT-1 through ERT-4). Of these, only ERT-1 is currently used as a long-term extraction well, capable of producing approximately 20 gpm. This well was installed as a 6-inch diameter open-hole bedrock well to approximately 200 feet bgs.

- Approximately 150 residences exist within the proposed High Falls Water District. As many as eighty-two residential, commercial, and/or municipal water supply wells have been sampled and included in the compiled data sets. Nine of these residential wells have been monitored and sampled on a regular basis and are identified on Table 1. Five of the nine regularly monitored residential wells are adjacent to or upgradient of the site (171 Mohonk, 183 Mohonk, 187 Mohonk, 191 Mohonk, and 210 Mohonk) (see Figure 1A). Four of the wells are downgradient of the site (11 Canal, 79

Mohonk, 123 Mohonk, and 130 Mohonk). All nine of these residential wells are open-hole bedrock wells ranging in depth from 78 to 400 feet bgs (see Table 1). Top of casing (TOC) elevations were unavailable for five of these wells (79, 123, 130, 171, and 183 Mohonk Road) and were therefore not incorporated into the groundwater contour maps contained in this report. The depths to bedrock and well yields are unknown for all residential wells.

3.2 Data Presentation

The data summary tables for the six data sets are presented in Tables 2 to 7 in Appendix A. Groundwater elevation and contaminant concentration contour maps are presented in Figures 1A through 6A and 1B through 6B, respectively, in Appendix B. Water level data in the tables and figures represents the depth measured from the top of the well casing and groundwater elevations are measured in feet above mean sea level (AMSL). "Total VOCs" and "VOC" shown on the tables and figures represents the sum of the four volatile organic compounds (VOCs) of primary concern (1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, and trichloroethene).

There is a significant difference in well construction and groundwater elevation measurements between monitoring well MW-5B and the other bedrock wells in the area. Unlike the other bedrock wells in the area, which were drilled 100 feet bgs or deeper, MW-5B was only drilled to 34 feet bgs because a water-producing zone was intercepted at 29 to 34 feet bgs. Water level elevation differences between this and nearby deeper wells suggest the presence of a downward vertical gradient with limited hydraulic communication between the shallow and deep bedrock. Therefore, MW-5B was not used to determine horizontal hydraulic gradients when data for MW-5R was available.

It should also be noted that VOC concentration contour maps are based on highly variable data sets for the coverage area. This is especially true for the November/ December 1997 and May/June 1998 data sets, which incorporate numerous residential well data points. Construction and usage details for many residential wells are unknown. In addition, residential and monitoring wells with long open-hole/screened intervals may result in an averaging of actual groundwater elevation and contaminant concentrations at a specific location. Therefore, due to variability in well design/usage and fracture distribution, interpretations of plume morphology that result from these data must be considered estimates of actual conditions.

3.2.1 Pre-Pumping System

Groundwater elevation and total VOC concentration contour maps are presented for three data sets before construction and start-up of the Nearfield Plume groundwater treatment system (see Figures 1A through 3A and 1B through 3B). A discussion of each data set follows.

3.2.1.1 November/December 1997 Data

This data set (see Table 2) summarizes the water level data from 14 wells (three residential and 11 monitoring wells)collected in December 1997. Nine of these water levels are calculated from TOC water level measurements, while five water level values

were taken directly from the December 1997 bedrock groundwater contour map found in the 1998 RI report. There are no data for the three on-site extraction wells (MW-5R, MW-7R and ERT-1) and monitoring well MW-15B because these wells were not constructed until 1998/99. A bedrock groundwater contour map of the area (see Figure 1A) reveals that groundwater flow generally mimicked topography, which itself is structurally controlled by the northeast trending anticline (fold) on which the site exists. In general, groundwater flow was to the north-northeast with an average horizontal hydraulic gradient of 4.6%. There were also easterly and westerly components of flow downhill toward Coxing Kill to the east and Rondout Creek to the west. Between the site and well MW-13B, there was an average horizontal hydraulic gradient of 3.1% to the west. This flow pattern is generally consistent with what was expected based on presence of a dominant fracture set trending northeast-southwest with a conjugate and less prevalent fracture set trending northwest-southeast.

VOC concentrations from 78 wells (67 residential and 11 monitoring wells) are summarized in the November/December 1997 data set (see Table 2). VOCs were detected above NYSDEC Class GA groundwater standards in five of the 11 monitoring wells and in 51 of the 67 residential wells. Figure 1B depicts the approximate extent of VOC contamination based on the available data. Contamination has spread approximately 0.8 miles towards the north-northeast, parallel to Mohonk Road, and approximately 0.4 miles towards the east and west of the source area. The areal extent of the plume incorporates residential wells along Mohonk Road, Canal Road, and Route 213 in the hamlet of High Falls. The maximum concentration of VOCs in bedrock groundwater (5,800 micrograms per liter (µg/L) was detected immediately north of the on-site building below the source area. As Figure 1B shows, contamination has spread in the general direction of fracture orientation and groundwater flow.

3.2.1.2 May/June 1998 Data

This data set (see Table 3) summarizes the water level data from 12 monitoring wells (four on-site wells and eight off-site wells) collected in May 1998. A bedrock groundwater contour map of the area (see Figure 2A) reveals a groundwater flow pattern similar to that seen on Figure 1A. Groundwater primarily flowed to the north-northeast and northwest away from the site. The horizontal gradient to the north-northeast along Mohonk Road was approximately 4.8% while the gradient to the west toward MW-13B was approximately 3.5%. No residential water level data from this time period were identified.

The contaminant concentrations from 96 wells (82 residential , 12 monitoring, and two extraction wells) are summarized in the May/June 1998 data set (see Table 3). VOCs were detected above NYSDEC Class GA groundwater standards in eight of the 14 monitoring wells and in 58 of the 82 residential wells. Figure 2B depicts the approximate extent of VOC contamination based on the available data. This figure shows a similar contaminant distribution and overall areal extent as seen previously in November/ December 1997. Two notable exceptions include: 1) The source-area VOC concentration has decreased (all subsequent data sets reveal bedrock concentrations below 5,000 µg/L); and 2) The extent of relatively high concentrations within the interior

of the Farfield Plume appears to have expanded slightly. This is evidenced by the general increase in VOC concentration detected in residential wells along Mohonk Road, south of Canal Road (see Figures 1B and 2B).

3.2.1.3 October 1999 Data

The October 1999 data set (see Table 4) summarizes the water level data from 13 wells (ten monitoring wells and three extraction wells). These water levels were calculated based on the groundwater sampling event conducted October 4 – 12, 1998. The bedrock groundwater contour map of the area (see Figure 3A) depicts a pattern of groundwater flow similar to that seen in the previous figures. However, the horizontal hydraulic gradient to the north-northeast was smaller (approximately 3.7%) due to a decrease (flattening) of the gradient north of the site and south of the intersection of Canal and Mohonk roads. The gradient to the northwest towards MW-13B was slightly higher (5%). With the addition of ERT-1 to this data set, a high point (groundwater mound) is revealed near ERT-1 that was not previously identified. There is no residential water level data for this time period.

The contaminant concentrations from nineteen wells (five residential and 14 monitoring wells) are summarized in the October 1999 data set (see Table 4). VOCs were detected above NYSDEC Class GA groundwater standards in eight of the 14 monitoring wells. Figure 3B depicts the approximate extent of VOC contamination based on the available data. This figure shows a similar contaminant distribution as seen previously; however, concentrations within the interior portion of the Farfield Plume appear to have expanded compared to the previous data sets. This is most evident in the concentration of VOCs detected in monitoring well MW-12B. The concentration increased from 15 µg/L in May 1998 to 512 µg/L in October 1999. Significantly less residential well data was available for October 1999 compared to previous data sets. Therefore, the extent of contamination in the distal end of the plume was estimated based on changes observed between very few points. In the source area (Nearfield Plume), the maximum total VOC concentration in the bedrock wells (3,300 µg/L) remained relatively stable compared to the previous data set (see Figures 2B and 3B).

3.2.2 Post-Pumping System

Groundwater elevation and total VOC concentration contour maps are presented for two data sets following construction and start-up of the Nearfield Plume groundwater treatment system (see Figures 4A, 5A, and 5B). Maps for a third data set for May/June 2001 are also planned but have not been completed pending receipt of water level data for the three extraction wells and a complete round of monitoring well analytical data. A discussion of each data set follows.

3.2.2.1 June 2000 Data

The June 2000 data set (see Table 5) summarizes the water level data from 15 wells (nine residential, three extraction, and three monitoring wells). Groundwater elevations from five of the residential wells could not be determined because top of casing elevations for these wells are unknown. A bedrock groundwater contour map of the area (see Figure 4A) shows groundwater flow is generally similar to that depicted for the pre-pumping

conditions (see Figures 1A, 2A, and 3A) except that a cone of depression is present around the actively pumping extraction wells. This closed-contour depression extends north and west of the MRIP building near all three extraction wells. In addition, it extends southward toward the residential well at 210 Mohonk Road (E. Jasinski). The presence of this depression has also resulted in a groundwater mound south and east of the MRIP building. Downgradient of the site, the horizontal gradient is similar to pre-pumping conditions (approximately 4.7% to the north-northeast); however, pumping has caused reversal of flow extending approximately 200 feet north of ERT-1.

VOC concentrations from the three extraction wells and one residential well sampled directly by the homeowner are summarized in Table 5. VOCs were detected above NYSDEC Class GA groundwater standards in all of these wells. The concentrations of VOCs detected in extraction wells MW-7R and ERT-1 decreased (530 to 480 µg/L and 1,800 to 540 µg/L respectively); however, the concentrations in MW-5R increased from 340 µg/L to 810 µg/L. Because no additional analytical data was identified from this time period, a contaminant concentration contour map of the area was not prepared.

3.2.2.2 December 2000 Data

The December 2000 data set (see Table 6) summarizes the water level data from 18 wells (nine residential, three extraction, and six monitoring wells). Five of the residential groundwater elevation levels were unable to be determined because the top of casing elevations for these wells are not known. A bedrock groundwater contour map of the area (See Figure 5A) reveals a flow pattern similar to that observed in June 2000 except that the regional flow direction appears to have turned north-northwest. The horizontal gradient in this area increases with distance from the site. Due north of the MRIP building it is approximately 2.6% to the north while near the intersection of Canal and Mohonk roads, it is approximately 9% north-northwest. As seen in June 2000, a cone of depression is present north and west of the MRIP building and extending southward toward the residential well at 210 Mohonk Road. A groundwater mound is also present southeast of the MRIP building.

VOC concentrations in 16 wells (two residential, three extraction and 11 monitoring wells) for December 2000 are summarized in Table 6. VOCs were detected above NYSDEC Class GA groundwater standards in five of the 11 monitoring wells and all three extraction wells. The VOC concentration contour map (see Figure 5B) shows a plume morphology similar to the pre-pumping data sets with a similar overall areal extent. However, compared to October 1999 (see Figure 3B), concentrations are lower and the areal extent of concentrations within the interior portions of the Nearfield and Farfield Plumes have decreased. This is evident in wells such as MW-12B where the total VOC concentration dropped from approximately 510 to 300 µg/L. Review of the 500 and 1,000 µg/L contour lines for October 1999 and December 2000 shows this decrease. The maximum concentration of total VOCs detected in source-area bedrock wells decreased from 3,300 to 2,500 µg/L. VOC contamination in two extraction wells (MW-7R and ERT-1) decreased by 26% and 70% respectively from October 1999 to December 2000. However, the concentrations in MW-5R increased by 70%.

3.2.2.3 May/June 2001 Data

The May/June 2001 data set is incomplete (see Table 8). Upon receipt of the groundwater sampling report for this time period, E & E will assess the new data. Production of a groundwater contour map has been initiated; however, additional monitoring and extraction well water level data are forthcoming. Therefore, no maps for this data set are presented in this report.

3.3 Capture Zone Estimations

Capture zones for the two post-pumping data sets (June and December 2000) are presented on Figures 4A and 5A. The capture zone areas were estimated based on the best available data and simplifying assumptions. The methodology for estimating these capture zones is discussed below.

The capture zone of a pumping well or group of wells can be calculated using some simplifying assumptions, or it can be modeled using complex mathematical models. Groundwater flow and contaminant transport at the MRIP site are complex and difficult to accurately define due to the variability associated with fracture-dominated flow in the bedrock. Fractured zones create preferential pathways of relatively high hydraulic conductivity, both vertically and horizontally, compared to non-fractured zones within the Shawangunk formation. Good data are not available for geometric calculation or mathematical modeling of the capture zones and would be prohibitive to collect. To define capture zones accurately, knowledge of bedrock fracture locations and orientations would be required. However, simplifying assumptions can be made in order to estimate the position and shape of the capture zone created by pumping in the Nearfield plume. These assumptions, as well as calculation results, are described below.

Initially, the location of the capture zone downgradient (based on pre-pumping conditions) of the pumping wells was estimated based on hydrogeologic principles including locations of groundwater divides, flowpaths, etc. This estimation was modified based on calculation performed to locate the stagnation point (distance downgradient from the pumping wells at which the wells no longer have an effect) and general shape of the capture zone. These calculations were based on simple well hydraulic equations (based on Darcy's Law), such as those described in Fetter (1994), and relate transmissivity (a function of hydraulic conductivity and aquifer thickness), pumping rate, and hydraulic gradient. The capture zone determined by these calculations is aligned to the direction of regional groundwater flow. Hydrogeologic parameters used in the calculations were as follows:

- The horizontal hydraulic conductivity (0.3 feet/day), transmissivity (66 gallons/day/foot), and aquifer thickness (200 feet) were consistent with those determined during the RI (LMS 1998) and as summarized in E & E's February 2001 Work Plan. The hydraulic gradient represents pre-pumping conditions;

- An average total pumping rate for the three extraction wells was determined for June and December 2000 based on data provided by USACE (24 and 18 gallons per minute (gpm), respectively); and

- A single pumping location at the centroid of the three extraction wells (based on relative pumping rates and distance) was used.

Based on these parameters, the distance to the stagnation point (distance of downgradient capture) was calculated to be approximately 280 to 370 feet. Upgradient of the pumping wells, the width of the capture zone was calculated to be approximately 1,700 to 2,400 feet. This method assumes steady-state flow through a uniform porous medium to a fully penetrating well screen. Because actual pumping rates vary, flow is not at steady state. Due to the highly complex fracture network, flow through the bedrock medium is not uniform. Well screen (open-hole) intervals vary. Therefore, because the underlying assumptions of the method are not directly applicable to a fracture-flow-dominated site, the resulting capture zone shape is only considered an approximation of actual conditions. However, the distance to the stagnation point was found to be relatively consistent with the initial estimation based on groundwater flow divides and contours. Therefore, capture zone approximation using this method is considered valid.

To provide additional information, the principle of conservation of mass was also applied. This method can be used to establish probable capture zone areas, but can not determine width and length relationships. The conservation of mass requires that, when the system is in equilibrium, the mass of groundwater being removed from the system equals the mass entering the system within the capture zone. Most groundwater is derived from direct infiltration of rainfall from the surface soil through the unsaturated zone and into the groundwater. Therefore, a literature review was conducted to estimate the average annual infiltration to groundwater (recharge) in the Shawangunk Mountains. Coates et al. (1994) discusses climate, surface hydrology, and water balance issues in detail. However, the authors state that "…infiltration to the aquifer is highly localized and can occur only where there is an open fracture" (page 36). They go on to say that an accurate estimate of the recharge can not be made except to qualitatively state "…that just a small fraction of the total runoff is available for recharge" (page 36). Based on long-term 20th century climate records, Coates et al. states that the average annual precipitation at Mohonk Lake is 48.2 inches.

Charbeneau (2000) tabulated deep percolation (groundwater recharge) amounts for several U.S. cities based on the *Hydrologic Evaluation of Landfill Performance* water balance model. Results were broken down by soil type for clay and clay loam soils in the New York and Boston areas, and the resulting recharge rates ranged from approximately 2.4 to 5.0 inches per year. Based on this information, recharge in the High Falls area was estimated to be 4 to 5 inches per year, approximately 10% of the annual precipitation. This equates to 300 to 380 gallons per day per acre. Dividing the average pumping rates of 24 and 18 gpm for June and December 2000 by the average recharge rate results in capture areas of 100 and 76 acres, respectively. These values are the equivalent of circles

2,000 to 2,400 feet in diameter. These diameters are comparable to the width of the capture zone determined above supporting the validity of the depicted capture zones.

The preceding capture zone discussion focused on groundwater movement within the bedrock. It is expected that the lateral extent of capture in the overburden is localized to the immediate vicinity of each pumping well. Based on the relatively low hydraulic conductivity of the glacial till overburden, it is expected that groundwater and dissolved contaminants within the overburden would preferentially move downward into the bedrock, rather than laterally, creating, in essence, a vertical capture zone.

4 Conclusions and Recommendations

4.1 Conclusions

With respect to groundwater gradients in the High Falls area, data from before and after start-up of the Nearfield Plume treatment system indicate little variance in direction and magnitude except near the treatment system, as expected. Regional flow is controlled by the structural geology of the area and is dominated by the orientation of pervasive fracture sets. Groundwater flow is primarily to the north-northeast with localized variations to the west and east towards Rondout Creek and Coxing Kill. In the vicinity of the Nearfield Plume treatment system, a cone of depression has been formed by actively pumping groundwater from the bedrock. This cone has resulted in capture of groundwater contaminated with VOCs in the direction that was formerly downgradient. That is, a groundwater divide approximately 300 feet north of the pumping wells has been created. The area of the capture zone was estimated to be less than 100 acres with a maximum width of approximately 1,200 – 1,400 feet. This information will be further utilized in design of the Farfield Plume groundwater treatment system.

Contaminant migration also appears to have been affected by the Nearfield Plume treatment system. Assessment of the data sets compiled prior to start-up of the Nearfield Plume treatment system revealed a system at relative equilibrium with respect to the overall areal extent of the plume. During this time, concentrations within the interior of the Farfield plume increased. That is, VOC concentrations in the 500 to 1,000 µg/L range appeared to expand. In comparison, with the initiation of pumping in the Nearfield Plume, these moderate concentrations in the interior of the plume decreased. Review of the 500 and 1,000 µg/L contour lines for October 1999 and December 2000 shows this decrease. However, the areal extent of the plume is estimated to have remained approximately the same size six months after pumping began (December 2000 data). Data in the distal portion of the plume after pumping began is limited; therefore additional assessment of recent plume morphology is necessary before definitive determinations can be made. Acquisition of May/June 2001 and other future data should help with this assessment. Comparison of VOC concentrations from pre-pumping conditions (October 1999) with recent conditions (December 2000) shows that concentrations have dropped by an average of 32% in monitoring and extraction wells (see Table 8).

A decrease in relatively high to moderate concentrations in the interior portion of the plume and no related decrease in the overall area of the plume after start-up of pumping

in the source-area are consistent. As aqueous-phase contaminants are captured, a decrease in dissolved contaminant concentrations will occur in the source area. Over time, the resulting decrease in the chemical gradient will result in lower concentrations downgradient. The rate of decrease will be dependent on plume velocity. Velocities within different fracture sets may vary and different areas of the plume may experience contaminant concentration decreases at different times. Furthermore, as contaminant mass flux from the source area continues to decrease, natural biodegradation along the leading edge of the plume could become more effective at reducing its overall areal extent.

4.2 Proposed Additional Work

Upon receipt of comments from USACE and USEPA, comments will be addressed and incorporated into this draft report to produce a final report. The final report will also incorporate additional maps from May/June 2001 if additional data from that time are received from USACE. Additional interpretation of the May/June 2001 data will be provided as applicable to the data set.

Evaluation of the data contained in this report has identified data gaps that could potentially affect the design of the Farfield Plume treatment system. This includes the installation of additional wells targeting discrete depth intervals at locations approximately midway between the plant site and MW-15B, between MW-12B and MW-15B, and further downgradient of MW-12B and MW-9B. Additional data in these areas would serve to better delineate the effectiveness of plume capture by the Nearfield Plume treatment system. It is possible that the installation of wells in these areas as part of the Farfield Plume pre-design investigation could serve the dual purpose of initial monitoring and later pumping. These and other data needs will be further evaluated during preparation of the Farfield Plume pre-design field sampling plan and Nearfield Plume treatment system Design Analysis Report.

Additional evaluations of existing water level and VOC concentration data is being conducted. The results of these evaluations will be reported in the Design Analysis Report for the existing treatment facilities. Examples of data to be assessed include temporal changes in water level and contaminant concentration at extraction wells and key “sentinel” monitoring and/or residential wells. In addition, statistical analytical tools may be applied to report trends of significance. These data, will be used to aid in selection of the number and locations of additional monitoring/extraction wells within the Farfield Plume.

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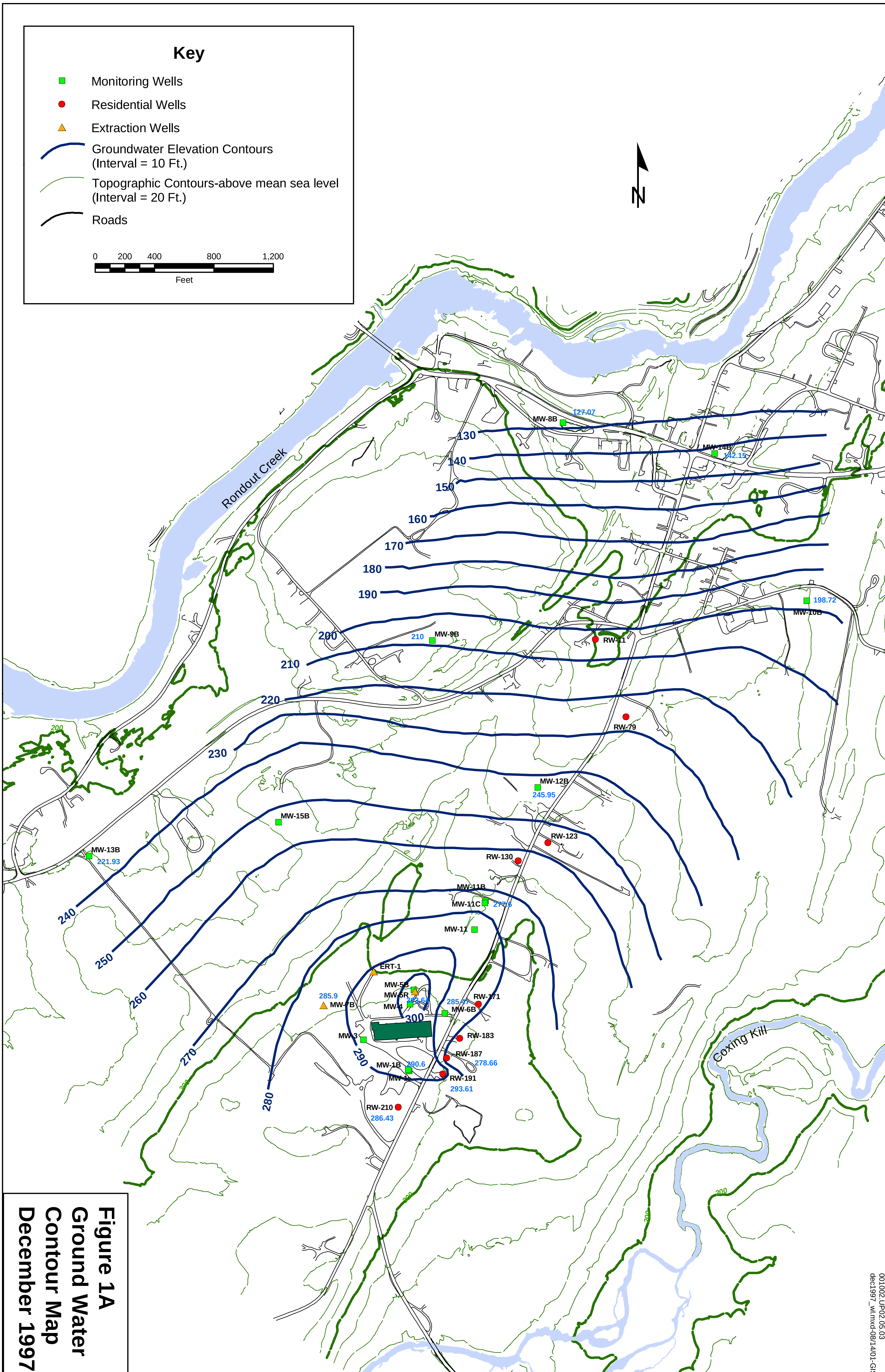


Figure 1A
Ground Water
Contour Map
December 1997

Key

- Monitoring Wells
- Residential Wells
- Extraction Wells
- 10 µg/L
- 100 µg/L
- 500 µg/L
- 1,000 µg/L
- 5,000 µg/L
- Topographic Contours-above mean sea level (Interval = 20 Ft.)
- Roads
- Water District Boundary

0 195 390 780 1,170

Feet

Note: VOC concentration contour lines are estimated due to variability in well design/usage and fracture distribution.

N

Rondout Creek

Depew Road

Berme Road

Canal Road

Mohonk Road

Coxing Kill

MW-8B ND

MW-14B ND

MW-10B ND

MW-9B ND

MW-12B 15

MW-15B

MW-13B ND

MW-11B 406

MW-11C

MW-5B

MW-5R

MW-7B 1,018

MW-4 5,814

MW-6B 87

MW-3

MW-1B ND

MW-1

RW-11

RW-79

RW-123

RW-130

RW-150

RW-171

RW-183

RW-187

RW-191

RW-210

ERT-1 5,000

MAIN ST

STATE RT 213 E

2ND ST

FIREHOUSE LN

MOHONK RD

STEELE HILL RD

FOURTH ST

SCHOOL HILL RD

SCHOOL RD

CANAL RD

DEPEW RD

10

100

500

1,000

5,000

200

300

400

001002.UP02.05.03
dec1997_tvc.mxd-08/14/01-GIS

Figure 1B
VOC Concentration Contour Map
November/December 1997

001002.UP02.05.03
may1998_wl.mxd-08/14/01-GIS

N

Key

- Monitoring Wells
- Residential Wells
- Extraction Wells
- Groundwater Elevation Contours (Interval = 10 Ft.)
- Topographic Contours-above mean sea level (Interval = 20 Ft.)
- Roads

0 200 400 800 1,200 Feet

Figure 2A Ground Water Contour Map May 1998

Key

- Monitoring Wells
- Residential Wells
- Extraction Wells
- 10 µg/L
- 100 µg/L
- 500 µg/L
- 1,000 µg/L
- Topographic Contours-above mean sea level (Interval = 20 Ft.)
- Roads
- Water District Boundary

0 195 390 780 1,170

Feet

Note: VOC concentration contour lines are estimated due to variability in well design/usage and fracture distribution.

N

Rondout Creek

Depew Road

Berme Road

Canal Road

Mohonk Road

Coxing Kill

MW-8B ND

MW-14B

MW-10B ND

MW-9B ND

MW-12B 15

MW-15B 424

MW-13B ND

MW-11B 678

MW-11C

MW-17

ERT-1

MW-5B 3,371

MW-5R 1587

MW-4

MW-7B 60

MW-7R 1,170

MW-3

MW-6B 24

MW-1B ND

MW-1

RW-11

RW-79

RW-123

RW-130

RW-171

RW-183

RW-187

RW-191

RW-210

OLD RT 213

STATE RT 213 E

MAIN ST

2ND ST

FIREHOUSE RD

MOHONK RD

FOURTH ST

SCHOOL HILL RD

CANAL RD

DEPEW RD

BERME RD

10

100

500

1,000

200

300

400

001002.UP02.05.03
may1998_tvc.mxd-08/14/01-GIS

Figure 2B
VOC Concentration Contour Map
May/June 1998

001002.UP02.05.03
oct1999_wl.mxd-08/14/01-GIS

N

Key

- Monitoring Wells
- Residential Wells
- Extraction Wells
- Groundwater Elevation Contours (Interval = 10 Ft.)
- Topographic Contours-above mean sea level (Interval = 20 Ft.)
- Roads

0 200 400 800 1,200
Feet

Figure 3A
Ground Water Contour Map
October 1999

001002.UP02.05.03
oct1999_tvc.mxd-08/14/01-GIS

N

Key

- Monitoring Wells
- Residential Wells
- Extraction Wells
- 10 µg/L
- 100 µg/L
- 500 µg/L
- 1,000 µg/L
- Topographic Contours-above mean sea level (Interval = 20 Ft.)
- Roads
- Water District Boundary

0 195 390 780 1,170 Feet

Note: VOC concentration contour lines are estimated due to variability in well design/usage and fracture distribution.

Coxing Kill

Depew Road

Rondout Creek

Belmie Road

Canal Road

Mohonk Road

MW-10B ND
MW-14B ND
RW-1309 0.5
RW-1300 7.4
RW-1305 1
MW-8B 68
RW-11
RW-79
MW-12B 512
RW-123
RW-130
MW-14B 225
MW-14C
MW-11
RW-171
MW-6B
RW-193
RW-187
RW-18
RW-191 ND
RW-209-201 ND
MW-8B ND
MW-5B 3,330
MW-5R 334
MW-4
ERT-1 1,764
MW-1B ND
MW-3
RW-210 ND
MW-4B NA
MW-7R 532
MW-15B 453
RW-159 ND
MW-13B ND

10
100
500
1,000

Figure 3B
VOC Concentration Contour Map
October 1999

001002.UP02.05.03
june2000_wl.mxd-08/14/01-GIS

N

MW-14B
MW-10B
MW-8B
MW-9B
MW-15B
MW-13B
RW-81
RW-79
RW-123
RW-129
RW-130
MW-11B
MW-11C
MW-11
RW-171
MW-6B
RW-183
RW-187
RW-191
MW-12
RW-210
MW-1
MW-2
MW-3
MW-4
MW-5R
MW-5B
MW-7B
ERT-1

128.4
242.6
254.3
254.5
273.3
267.6
252.8
242.1

180
190
200
210
220
230
240
250
260
270
300

Key

- Monitoring Wells
- Residential Wells
- Extraction Wells
- Groundwater Elevation Contours (Interval = 10 Ft.)
- Topographic Contours-above mean sea level (Interval = 20 Ft.)
- Estimated Capture Zone
- Roads

0 200 400 800 1,200 Feet

Figure 4A
Ground Water Contour Map
June 2000

001002.UP02.05.03
dec2000_wl.mxd-08/13/01-GIS

N

MW-14B
MW-10B
197.9
MW-8B
MW-9B
MW-13B
MW-15B
227.0
MW-12B
243.7
RW-79
RW-123
RW-130
MW-11B
249.7
MW-11C
MW-11
RW-171
MW-6B
250.8
RW-183
RW-187
252.1
RW-191
272.1
MW-5B
245.9
MW-5R
MW-4
MW-7B
MW-3
ERT-1
RW-210
251.8

180
190
200
210
220
230
240
250
260
270
300

Key

- Monitoring Wells
- Residential Wells
- Extraction Wells
- Groundwater Elevation Contours (Interval = 10 Ft.)
- Topographic Contours-above mean sea level (Interval = 20 Ft.)
- Estimated Capture Zone
- Roads

0 200 400 800 1,200 Feet

Figure 5A
Ground Water Contour Map
December 2000

Key

- Monitoring Wells
- Residential Wells
- Extraction Wells
- 10 µg/L
- 100 µg/L
- 500 µg/L
- 1,000 µg/L
- Topographic Contours-above mean sea level (Interval = 20 Ft.)
- Roads
- Water District Boundary

0 195 390 780 1,170

Feet

Note: VOC concentration contour lines are estimated due to variability in well design/usage and fracture distribution.

N

Rondout Creek
Depew Road
Berme Road
Canal Road
Mohonk Road
Coxing Kill

MW-8B
MW-14B
ND
MW-9B
ND
MW-10B
ND
RW-11
RW-79
MW-12B
296
MW-15B
350
MW-13B
ND
RW-123
RW-130
226
MW-11B
MW-11C
MW-11
519
ERT-1
MW-5B
2,543
MW-5R
573
NM
MW-7B
MW-7R
391
MW-4
MW-6B
31
RW-171
MW-3
RW-183
RW-187
ND
MW-1B
MW-1
RW-191
RW-210

10
100
500
1,000
200
300

Figure 5B
VOC Concentration Contour Map
December 2000

001002.UP02.05.03
dec2000_tvc.mxd-08/14/01-GIS

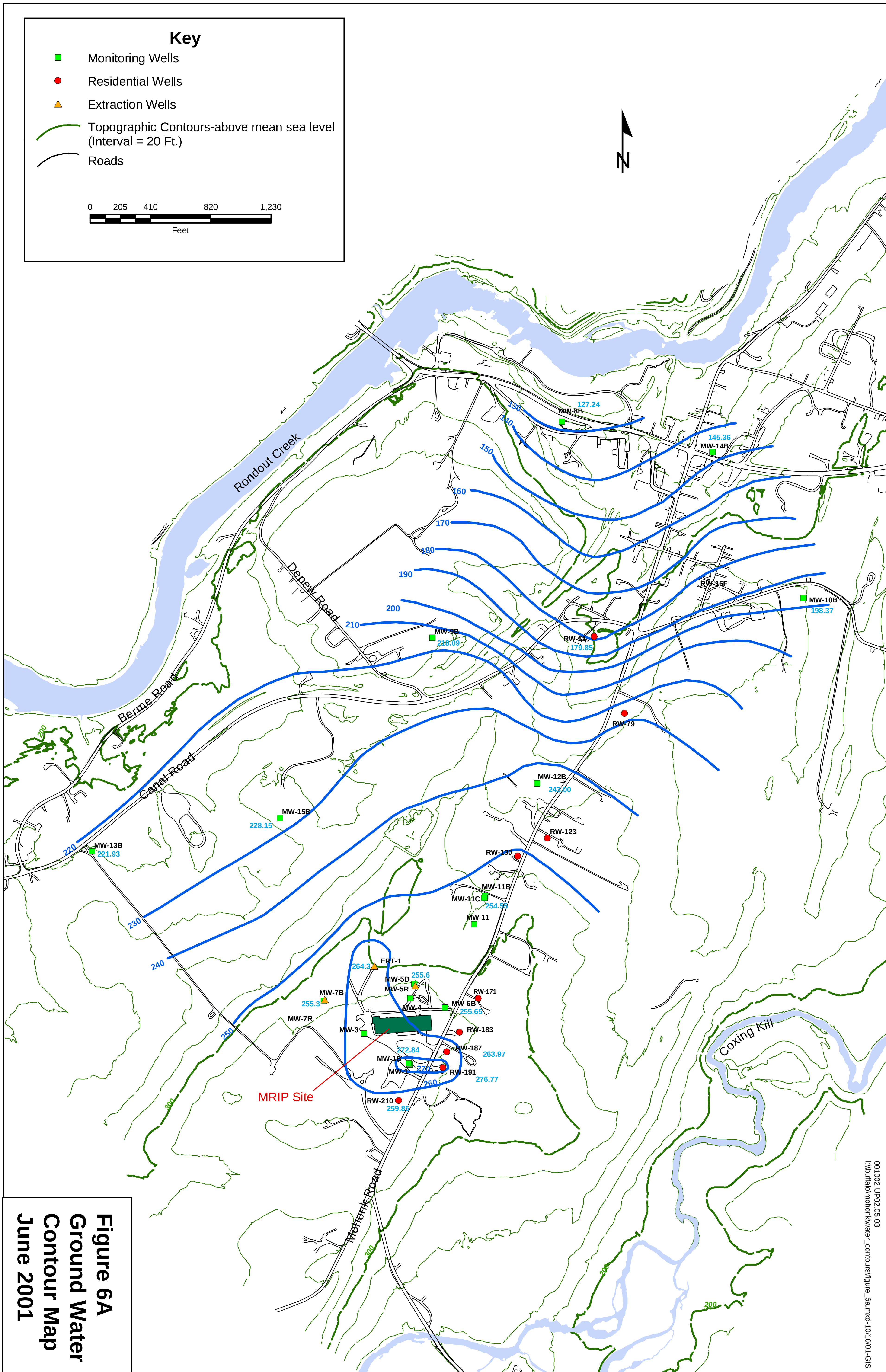


Figure 6A
Ground Water
Contour Map
June 2001

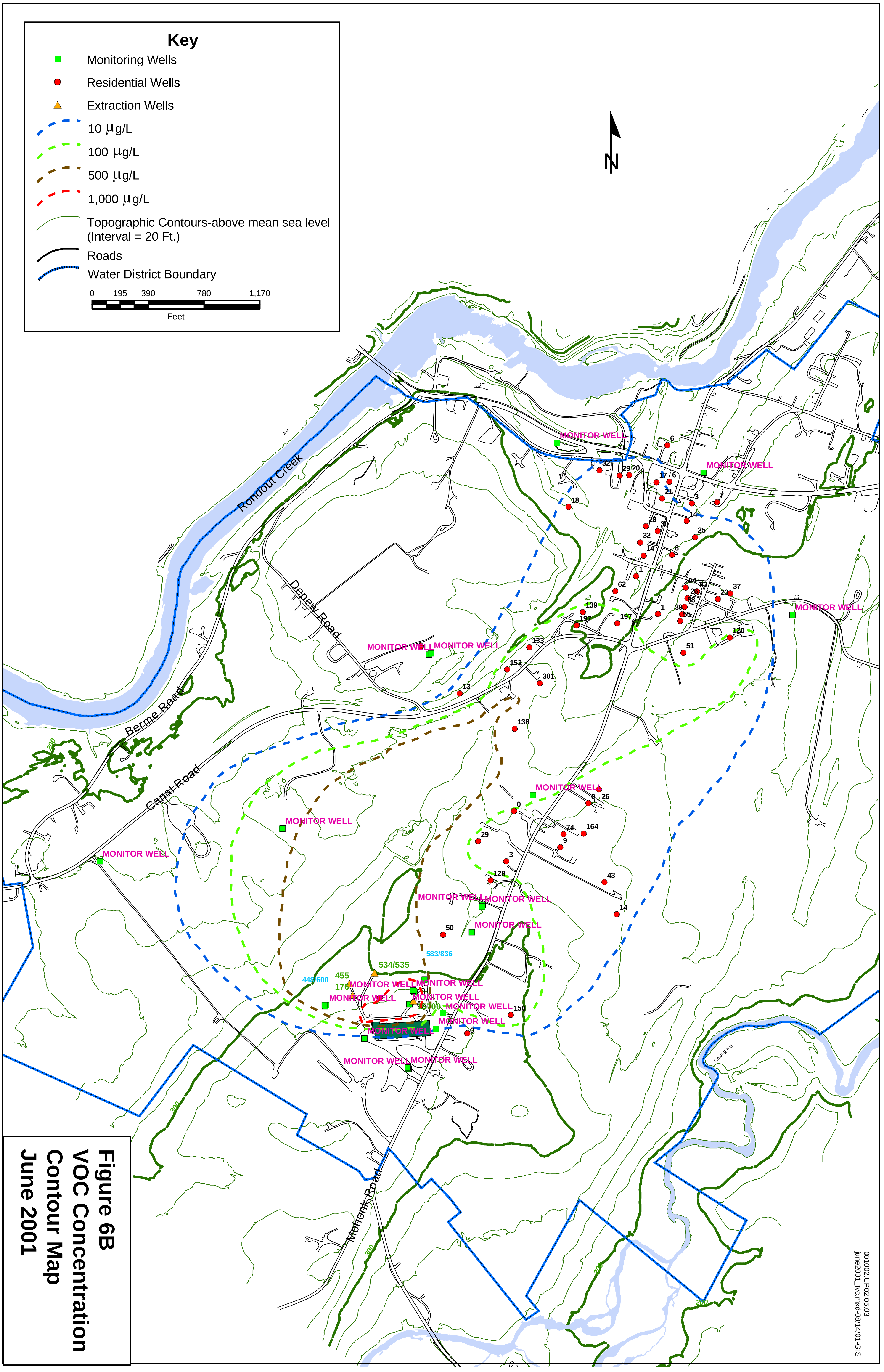


Figure 6B
VOC Concentration
Contour Map
June 2001

Table 1 Well Construction Summary, Mohonk Road Site

Location/Well ID	Well Elevation (feet amsl)	Well Depth (feet bgs)	Depth to Bedrock (feet bgs)	Open-hole Interval (feet bgs)	Reported Well Yield (gpm)
Residential					
79 Mohonk Rd	NA	120	NA	NA	NA
123 Mohonk Rd	NA	133	NA	NA	NA
130 Mohonk Rd	NA	78	NA	NA	NA
171 Mohonk Rd	NA	200	NA	NA	NA
183 Mohonk Rd	NA	400	NA	NA	NA
187 Mohonk Rd	325.16	325	NA	NA	NA
191 Mohonk Rd	328.41	125	NA	NA	NA
210 Mohonk Rd	337.63	100	NA	NA	NA
11 Canal Rd	211.65	205	NA	NA	NA
Monitoring/Extraction					
MW-1B	333.53	100	12.0	22 - 100	NA
MW-5B	325.3	34	9.0	19 - 34	NA
MW-5R	313.63	125	10.0	15 - 125	50
MW-6B	323.95	100	28.0	39 - 100	NA
MW-7B	313.93	100	14.0	24 - 100	NA
MW-7R	314.3	180	14.0	24 - 100	18-20
MW-8B	159.68	100	39.0	48 - 100	10 -15
MW-9B	248.21	145	85.0	95 - 145	4
MW-10B	225.64	100	14.0	24 - 100	2
MW-11B	281.72	181	39.0	49 - 181	50
MW-12B	258.2	200	7.0	18 - 200	10
MW-13B	221.93	200	68.0	78 - 200	150
MW-14B	156.67	155	16.0	26 - 155	trace
MW15B	245.7	150	28.0	38 - 142	8
ERT-1	314.3	195	18.0	28 - 195	20

KEY

amsl = above mean sea level

bgs = below ground surface

gpm = gallons per minute

NA = Data Not Available

Table 2 Groundwater Level and Analytical Data, November / December 1997
Mohonk Road Industrial Plant Site

Location/Well ID	Water Level (ft TOC)	Water Level Elevation (ft AMSL)	1,1 DCE	1,1 DCA	1,1,1 TCA	TCE	Total VOCs [b]
NOVEMBER 1997 DATA							
Residential							
101 Mohonk Road	NM	NM	27	5	95	5	132
103 Main Street	NM	NM	11	10	21	1	43
107 Main Street	NM	NM	4	5	ND	ND	9
107 Mohonk Road	NM	NM	ND	0.9	4	ND	4.9
11 Fourth Street	NM	NM	12	20	8	ND	40
11 Mohonk Road	NM	NM	ND	ND	ND	ND	ND
112 Steep Hill Road	NM	NM	15	24	11	ND	50
113 Main Street	NM	NM	2	3	1	ND	6
117 Mohonk Road	NM	NM	4	11	ND	3	18
120 Mohonk Road	NM	NM	ND	ND	5	ND	5
1203 Route 213	NM	NM	15	24	11	ND	50
121 Main Street	NM	NM	5	5	15	ND	25
1219 Route 213	NM	NM	4	6	ND	ND	10
123 Mohonk Road	NM	NM	35	9	100	7	151
125 Mohonk Road	NM	NM	60	15	240	10	325
126 Mohonk Road	NM	NM	70	10	610	20	710
130 Mohonk Road	NM	NM	ND	1	9	ND	10
1304 Route 213	NM	NM	0.9	0.9	ND	ND	1.8
1315 Route 213	NM	NM	21	10	ND	5	36
138 Mohonk Road	NM	NM	150	30	840	40	1060
14 Fourth Street	NM	NM	21	33	14	ND	68
150 Mohonk Road	NM	NM	ND	ND	50	ND	50
159 Canal Road	NM	NM	ND	ND	7	ND	7
16 Fourth Street	NM	NM	10	16	12	1	39
16 School Hill Road	NM	NM	29	32	55	1	117
162 Mohonk Road	NM	NM	ND	ND	0.6	ND	0.6
17 Mohonk Road	NM	NM	ND	ND	14	ND	14
171 Mohonk Road	NM	NM	25	5	170	5	205
18 Fourth Street	NM	NM	27	43	16	1	87
183 Mohonk Road	NM	NM	ND	ND	ND	ND	ND
186 Mohonk Road	NM	NM	23	6	160	12	201
20 Fourth Street	NM	NM	25	35	20	1	81
20 Mohonk Road	NM	NM	10	6	47	1	64
22 Fourth Street	NM	NM	38	51	13	1	103
23 Mohonk Road	NM	NM	8	16	10	ND	34
24 Mohonk Road	NM	NM	11	6	44	1	62
28 Mohonk Road	NM	NM	9	12	24	1	46
30 Canal Road	NM	NM	95	80	460	15	650
30 School Hill	NM	NM	42	43	56	2	143
31 Canal Road	NM	NM	22	23	25	2	72
31 Mohonk Road	NM	NM	2	5	2	ND	9
32 Mohonk Road	NM	NM	6	4	25	ND	35
321 Mohonk Road	NM	NM	23	33	60	5	121
35 Mohonk Road	NM	NM	10	19	13	ND	42
36 Mohonk Road	NM	NM	3	ND	13	ND	16
4 Fire House Road	NM	NM	3	11	ND	ND	14
40 Canal Road	NM	NM	110	30	160	15	315
41 & 43Canal Road	NM	NM	120	35	410	15	580
44 Mohonk Road	NM	NM	ND	ND	2	ND	2
49 Mohonk Road	NM	NM	4	7	11	ND	22

Location/Well ID	Water Level (ft TOC)	Water Level Elevation (ft AMSL)	1,1 DCE	1,1 DCA	1,1,1 TCA	TCE	Total VOCs [b]
50 Mohonk Road	NM	NM	15	5	110	5	135
51 Depew Road	NM	NM	ND	3	ND	ND	3
52 Canal Road	NM	NM	2	7	0.7	ND	9.7
53 Mohonk Road	NM	NM	29	24	92	2	145
58 Mohonk Road	NM	NM	78	71	220	5	374
6 Second Street	NM	NM	2	3	6	ND	11
7 Second Street (Antiq	NM	NM	19	14	ND	ND	33
7 Steep Hill Road	NM	NM	11	6	56	1	74
7-11 Fire House Road	NM	NM	6	7	ND	ND	13
9 Fourth Street	NM	NM	10	26	6	ND	42
Canal Road	NM	NM	45	10	180	5	240
Canal Road	NM	NM	70	20	390	ND	480
DECEMBER 1997 DATA							
Residential							
79 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
123 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
130 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
171 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
183 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
187 Mohonk Rd	46.5	278.66	NM	NM	NM	NM	NM
191 Mohonk Rd	34.8	293.61	NM	NM	NM	NM	NM
210 Mohonk Rd	51.2	286.43	NM	NM	NM	NM	NM
11 Canal Rd	NM	NM	NM	NM	NM	NM	NM
Monitoring/Extraction							
MW-1B	43.33	290.20	ND	ND	ND	ND	ND
MW-5B	NA	303.64 [a]	200	40 J	1,800	110 J	5,814
MW-5R	NC	NC	NC	NC	NC	NC	NC
MW-6B	38.48	285.47	12	3 J	72	ND	87
MW-7B	28.03	285.90	49 J	24 J	930	15 J	1,018
MW-7R	NC	NC	NC	NC	NC	NC	NC
MW-8B	NA	127.07 [a]	ND	ND	ND	ND	ND
MW-9B	NA	210.00 [a]	ND	ND	ND	ND	ND
MW-10B	26.92	198.72	ND	ND	ND	ND	ND
MW-11B	4.14	277.58	52	33	300	21	406
MW-12B	12.25	245.95	3 J	3 J	9 J	ND	15
MW-13B	NA	221.93 [a]	ND	ND	ND	ND	ND
MW-14B	NA	142.15 [a]	ND	ND	ND	ND	ND
MW15B	NC	NC	NC	NC	NC	NC	NC
ERT-1	NC	NC	NC	NC	NC	NC	NC

Note: All analytical results are reported in micrograms per liter.

[a] Water levels values were taken directly from the December 1997 groundwater countour map found in the 1998 RI report.

[b] The Total VOC column is the sum of the four listed contaminants.

KEY:

AMSL = Above Mean Sea Level
TOC = Top of Casing
ft = Feet
VOC = Volatile Organic Compound
J = Estimated concentration
NA = Data Not Available
NC = Not Constructed
ND = Not Detected
NM = Not Measured

Table 3 Groundwater Level and Analytical Data, May / June 1998
Mohonk Road Industrial Plant Site

Location/Well ID	Water Level (ft TOC)	Water Level Elevation (ft AMSL)	1,1 DCE	1,1 DCA	1,1,1 TCA	TCE	Total VOCs [b]
MAY 1998 DATA							
Residential							
79 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
123 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
130 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
171 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
183 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
187 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
191 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
210 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
11 Canal Rd	NM	NM	NM	NM	NM	NM	NM
Monitoring/Extraction							
MW-1B	NA	295.06 [a]	ND	ND	ND	ND	ND
MW-5B	NA	287.18 [a]	390	31 J	2,800	150 J	3,371
MW-5R	NM	NM	270	56	1,300	61	1,687
MW-6B	NA	289.82 [a]	ND	ND	21	ND	21
MW-7B	NA	289.64 [a]	4 J	2 J	54	ND	60
MW-7R	NM	NM	98	97	970	5	1,170
MW-8B	NA	128.27 [a]	ND	ND	ND	ND	ND
MW-9B	NA	220.28 [a]	ND	ND	ND	ND	ND
MW-10B	NA	201.24 [a]	ND	ND	ND	ND	ND
MW-11B	NA	283.61 [a]	110	39	490	31	670
MW-12B	NA	246.26 [a]	3 J	3 J	9 J	ND	15
MW-13B	NA	223.83 [a]	ND	ND	ND	ND	ND
MW-14B	NA	147.55 [a]	ND	ND	ND	ND	ND
MW15B	NA	228.97 [a]	58	24	340	2 J	424
ERT-1	NM	NM	NM	NM	NM	NM	NM
JUNE 1998 DATA							
Residential							
45 School Hill Road	NM	NM	0.5	1.3	ND	ND	1.8
1300 Route 213	NM	NM	2	1.5	ND	ND	3.5
187 Mohonk Road	NM	NM	ND	ND	0.5	ND	0.5
29 Lower 27 Knolls Ro	NM	NM	ND	ND	ND	ND	ND
159 Canal Road	NM	NM	ND	ND	ND	ND	ND
210 Mohonk Road	NM	NM	ND	ND	ND	ND	ND
55 Old Route 213	NM	NM	ND	ND	ND	ND	ND
7 Second Street (Ice H	NM	NM	3.2	3.1	ND	ND	6.3
1 Fourth Street	NM	NM	0.9	4.1	1.3	ND	6.3
125 & 133 Main Street	NM	NM	0.5	0.5	ND	ND	1
191 Mohonk Road	NM	NM	ND	ND	ND	ND	ND
1097 Berme Road	NM	NM	ND	1.1	ND	ND	1.1
1105 Berme Road	NM	NM	ND	ND	ND	ND	ND
18 Depew Road	NM	NM	ND	ND	ND	ND	ND
30 Depew Road	NM	NM	ND	ND	ND	ND	ND
10 Depew Road	NM	NM	ND	ND	ND	ND	ND
44 Mohonk Road	NM	NM	0	ND	4	ND	4
4 Fire House Road	NM	NM	5	13	11	ND	29
50 Mohonk Road	NM	NM	23	8	85	4	120
17 Mohonk Road	NM	NM	7	11	2	ND	20
7 Second Street (Antiq	NM	NM	19	14	ND	ND	33
31 Canal Road	NM	NM	130	150	110	15	405
123 Mohonk Road	NM	NM	17	4	73	4	98
120 Mohonk Road	NM	NM	7	1	35	2	45
107 Mohonk Road	NM	NM	7	2	27	1	37
30 Canal Road	NM	NM	30	9	120	4	163
162 Mohonk Road	NM	NM	8	1	36	2	47
7-11 Fire House Road	NM	NM	6	6	ND	ND	12
6 Second Street	NM	NM	6	7	13	ND	26
36 Mohonk Road	NM	NM	5	2	20	ND	27
32 Mohonk Road	NM	NM	9	3	34	1	47
115 Mohonk Road	NM	NM	82	23	330	18	453

Location/Well ID	Water Level (ft TOC)	Water Level Elevation (ft AMSL)	1,1 DCE	1,1 DCA	1,1,1 TCA	TCE	Total VOCs [b]
113 Main Street	NM	NM	20	9	71	2	102
9 Clovewood Road	NM	NM	ND	ND	ND	ND	ND
126 Mohonk Road	NM	NM	77	15	450	20	562
1304 Route 213	NM	NM	5	3	ND	ND	8
103 Main Street	NM	NM	23	14	31	1	69
20 Fourth Street	NM	NM	13	15	18	ND	46
121 Main Street	NM	NM	12	9	22	ND	43
24 Mohonk Road	NM	NM	9	7	32	ND	48
9 Fourth Street	NM	NM	13	18	10	ND	41
11 Fourth Street	NM	NM	13	23	8	ND	44
117 Mohonk Road	NM	NM	12	9	22	29	72
159 Canal Road	NM	NM	1	ND	13	ND	14
321 Mohonk Road	NM	NM	ND	ND	ND	ND	ND
20 Mohonk Road	NM	NM	9	5	36	1	51
14 Fourth Street	NM	NM	14	22	9	ND	45
22 Fourth Street	NM	NM	27	37	15	ND	79
1315 Route 213	NM	NM	31	11	ND	ND	42
18 Fourth Street	NM	NM	19	33	12	ND	64
51 Depew Road	NM	NM	ND	7	ND	ND	7
1203 Route 213	NM	NM	6	14	1	ND	21
11 Mohonk Road	NM	NM	2	4	1	ND	7
52 Canal Road	NM	NM	1	5	ND	ND	6
28 Mohonk Road	NM	NM	7	10	25	ND	42
171 Mohonk Road	NM	NM	54	7	260	6	327
41 & 43Canal Road	NM	NM	33	11	140	6	190
101 Mohonk Road	NM	NM	25	6	110	5	146
130 Mohonk Road	NM	NM	49	12	300	15	376
58 Mohonk Road	NM	NM	66	62	130	4	262
40 Canal Road	NM	NM	33	11	130	6	180
321 Mohonk Road	NM	NM	20	31	44	ND	95
7 Steep Hill Road	NM	NM	22	13	81	2	118
53 Mohonk Road	NM	NM	31	29	92	3	155
125 Mohonk Road	NM	NM	56	12	170	7	245
186 Mohonk Road	NM	NM	6	ND	42	ND	48
35 Mohonk Road	NM	NM	14	23	17	ND	54
186 Mohonk Road	NM	NM	6	ND	42	ND	48
31 Mohonk Road	NM	NM	6	10	5	ND	21
107 Main Street	NM	NM	6	6	ND	ND	12
1219 Route 213	NM	NM	ND	4	ND	ND	4
23 Mohonk Road	NM	NM	13	20	17	ND	50
117 Mohonk Road	NM	NM	29	8	130	6	173
30 School Hill	NM	NM	29	33	47	2	111
49 Mohonk Road	NM	NM	5	8	9	ND	22
112 Steep Hill Road	NM	NM	14	21	10	ND	45
Canal Road	NM	NM	26	10	88	4	128
Canal Road	NM	NM	41	14	150	7	212
7 Second Street (Ice H	NM	NM	6	6	ND	ND	12
150 Mohonk Road	NM	NM	34	7	210	7	258
138 Mohonk Road	NM	NM	140	28	740	40	948

Note: All analytical results are reported in micrograms per liter.

[a] Water levels values were taken directly from the December 1997 groundwater countour map found in the 1998 RI report.

[b] The Total VOC column is the sum of the four listed contaminants.

KEY:

AMSL = Above Mean Sea Level
TOC = Top of Casing
ft = Feet
VOC = Volatile Organic Compound
J = Estimated concentration
NA = Data Not Available
NC = Not Constructed
ND = Not Detected
NM = Not Measured

Table 4 Groundwater Level and Analytical Data, October 1999
Mohonk Road Industrial Plant Site

Location/Well ID	Water Level (ft TOC)	Water Level Elevation (ft AMSL)	1,1 DCE	1,1 DCA	1,1,1 TCA	TCE	Total VOCs [a]
Residential							
79 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
123 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
130 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
171 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
183 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
187 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
191 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
210 Mohonk Rd	NM	NM	NM	NM	NM	NM	NM
11 Canal Rd	NM	NM	NM	NM	NM	NM	NM
1300 Route 213	NM	NM	4.4	3	ND	ND	7.4
159 Canal Road	NM	NM	ND	ND	ND	ND	ND
1209 Route 213	NM	NM	ND	0.5	ND	ND	0.5
125 & 133 Main St.	NM	NM	0.5	0.5	ND	ND	1
199 Mohonk Road	NM	NM	ND	ND	ND	ND	ND
Monitoring/Extraction							
MW-1B	56.8	276.7	ND	ND	ND	ND	ND
MW-5B	26.22	299.08	250	50	2,900	130	3,330
MW-5R	41.4	272.23	28	7	290	16	341
MW-6B	50.86	273.09	7 J	2 J	58	ND	67
MW-7B	NM	NM	NM	NM	NM	NM	NM
MW-7R	42.45	271.85	35	23	470	4 J	532
MW-8B	34.9	124.78	ND	ND	ND	ND	ND
MW-9B	31.4	216.81	ND	ND	ND	ND	ND
MW-10B	31.95	193.69	ND	ND	ND	ND	ND
MW-11B	13.15	268.57	29	15	190	11	245
MW-12B	14.8	243.4	72	37	380	23 J	512
MW-13B	NM	NM	ND	ND	ND	ND	ND
MW-14B	10.43	146.24	ND	ND	ND	ND	ND
MW15B	21.94	223.76	39	30	380	4 J	453
ERT-1	31.95	282.35	170	94	1400	100	1,764

Note: All analytical results are reported in micrograms per liter.

[a] The Total VOC column is the sum of the four listed contaminants.

KEY:

AMSL = Above Mean Sea Level
TOC = Top of Casing
ft = Feet
VOC = Volatile Organic Compound
J = Estimated concentration
NA = Data Not Available
NC = Not Constructed
ND = Not Detected
NM = Not Measured

Table 5 Groundwater Level and Analytical Data, June 2000
Mohonk Road Industrial Plant Site

Location/Well ID	Water Level (ft TOC)	Water Level Elevation (ft AMSL)	1,1 DCE	1,1 DCA	1,1,1 TCA	TCE	TOTAL VOCs [a]
Residential							
79 Mohonk Rd [b]	2.9	NA	47	24	150	11	230
123 Mohonk Rd	21.5	NA	NM	NM	NM	NM	NM
130 Mohonk Rd	20.0	NA	NM	NM	NM	NM	NM
171 Mohonk Rd	57.6	NA	NM	NM	NM	NM	NM
183 Mohonk Rd	75.3	NA	NM	NM	NM	NM	NM
187 Mohonk Rd	70.7	254.5	NM	NM	NM	NM	NM
191 Mohonk Rd	54.5	273.9	NM	NM	NM	NM	NM
210 Mohonk Rd	84.8	252.8	NM	NM	NM	NM	NM
11 Canal Rd	32.8	178.9	NM	NM	NM	NM	NM
Monitoring/Extraction							
MW-1B	65.7	267.8	NM	NM	NM	NM	NM
MW-5B	NM	NM	NM	NM	NM	NM	NM
MW-5R	64.9	248.7	100	27	650	32	809
MW-6B	69.7	254.3	NM	NM	NM	NM	NM
MW-7B	NM	NM	NM	NM	NM	NM	NM
MW-7R	72.1	242.2	50	20	410	1.7	482
MW-8B	NM	NM	NM	NM	NM	NM	NM
MW-9B	NM	NM	NM	NM	NM	NM	NM
MW-10B	NM	NM	NM	NM	NM	NM	NM
MW-11B	29.1	252.6	NM	NM	NM	NM	NM
MW-12B	NM	NM	NM	NM	NM	NM	NM
MW-13B	NM	NM	NM	NM	NM	NM	NM
MW-14B	NM	NM	NM	NM	NM	NM	NM
MW15B	NM	NM	NM	NM	NM	NM	NM
ERT-1	63.8	250.5	88	18	410	21	537

Note: All analytical results are reported in micrograms per liter.

[a] The Total VOC column is the sum of the four listed contaminants.

[b] Analytical data from 5-1-01.

KEY:

AMSL = Above Mean Sea Level
TOC = Top of Casing
ft = Feet
VOC = Volatile Organic Compound
J = Estimated concentration
NA = Data Not Available
NC = Not Constructed
ND = Not Detected
NM = Not Measured

Table 6 Groundwater Level and Analytical Data, December 2000
Mohonk Road Industrial Plant Site

Location/Well ID	Water Level (ft TOC)	Water Level Elevation (ft AMSL)	1,1 DCE	1,1 DCA	1,1,1 TCA	TCE	Total VOCs [a]
Residential							
79 Mohonk Rd	3.0	NA	NM	NM	NM	NM	NM
123 Mohonk Rd	24.4	NA	NM	NM	NM	NM	NM
130 Mohonk Rd	22.6	NA	NM	NM	NM	NM	NM
171 Mohonk Rd	61.2	NA	NM	NN	NM	NM	NM
183 Mohonk Rd	77.3	NA	NM	NM	NM	NM	NM
187 Mohonk Rd	73.1	252.1	NM	NM	NM	NM	NM
191 Mohonk Rd	56.4	272.1	NM	NM	NM	NM	NM
210 Mohonk Rd	85.8	251.8	NM	NM	NM	NM	NM
11 Canal Rd	32.0	179.7	NM	NM	NM	NM	NM
Cedar Hill Rd #115	NM	NM	ND	ND	ND	ND	ND
Mossy Brook Rd #26	NM	NM	ND	ND	ND	ND	ND
Monitoring/Extraction							
MW-1B	71.2	262.3	ND	ND	ND	ND	ND
MW-5B	NM	NM	280	43	2100	120	2543
MW-5R	68.2	245.4	120	23	400	30	573
MW-6B	73.2	250.8	3	ND	28	ND	31
MW-7B	NM	NM	NM	NM	NM	NM	NM
MW-7R	74.6	239.7	44	27	320	ND	391
MW-8B	NM	NM	ND	ND	ND	ND	ND
MW-9B	NM	NM	ND	ND	ND	ND	ND
MW-10B	27.7	197.9	ND	ND	ND	ND	ND
MW-11B	32.1	249.7	ND	36	180	10	226
MW-12B	14.9	243.4	43	18	220	15	296
MW-13B	NM	NM	ND	ND	ND	ND	ND
MW-14B	NM	NM	ND	ND	ND	ND	ND
MW15B	18.7	227.0	63	37	250	ND	350
ERT-1	58.2	256.1	73 J	22	390 J	34	519

Note: All analytical results are reported in micrograms per liter.

[a] The Total VOC column is the sum of the four listed contaminants.

KEY:

AMSL = Above Mean Sea Level
TOC = Top of Casing
ft = Feet
VOC = Volatile Organic Compound
J = Estimated concentration
NA = Data Not Available
NC = Not Constructed
ND = Not Detected
NM = Not Measured

Table 7 Groundwater Level and Analytical Data, May/June 2001
Mohonk Road Industrial Plant Site

Location/Well ID	Water Level (ft TOC)	Level Elevation (ft AMSL)	1,1 DCE	1,1 DCA	1,1,1 TCA	TCE	Total VOCs [a]
Residential							
79 Mohonk Rd	4.93	NA	--	--	--	--	--
123 Mohonk Rd	25.32	NA	--	--	--	--	--
130 Mohonk Rd	21.97	NA	--	--	--	--	--
171 Mohonk Rd	50.55	NA	--	--	--	--	--
183 Mohonk Rd	54.22	NA	--	--	--	--	--
187 Mohonk Rd	58.25	266.91	--	--	--	--	--
191 Mohonk Rd	50.97	277.44	--	--	--	--	--
210 Mohonk Rd	72.57	265.06	--	--	--	--	--
11 Canal Rd	34.85	176.8	--	--	--	--	--
Monitoring/Extraction							
MW-1B	59.56	273.97	--	--	--	--	--
MW-5B	--	--	--	--	--	--	--
MW-5R	--	--	--	--	--	--	--
MW-6B	61.73	262.22	--	--	--	--	--
MW-7B	--	--	--	--	--	--	--
MW-7R	--	--	--	--	--	--	--
MW-8B	--	--	--	--	--	--	--
MW-9B	--	--	--	--	--	--	--
MW-10B	30.3	195.3	--	--	--	--	--
MW-11B	21.8	259.92	--	--	--	--	--
MW-12B	16.16	242.04	--	--	--	--	--
MW-13B	--	--	--	--	--	--	--
MW-14B	--	--	--	--	--	--	--
MW15B	19.97	225.73	--	--	--	--	--
ERT-1	--	--	--	--	--	--	--

Note: All analytical results are reported in micrograms per liter.

[a] The Total VOC column is the sum of the four listed contaminants.

KEY:

AMSL = Above Mean Sea Level
TOC = Top of Casing
ft = Feet
VOC = Volatile Organic Compound
J = Estimated concentration
NA = Data Not Available
NC = Not Constructed
ND = Not Detected
NM = Not Measured

Table 8 VOC Concentration Comparison
Mohonk Road Industrial Plant Site

Location	October 1999 Total VOC Concentration	December 2000 Total VOC Concentration	Relative Change
MW-1B	ND	ND	-
MW-5B	3,330	2,543	-24%
MW-5R	341	573	68%
MW-6B	67	31	-54%
MW-7B	NM	NM	-
MW-7R	532	391	-27%
MW-8B	ND	ND	-
MW-9B	ND	ND	-
MW-10B	ND	ND	-
MW-11B	245	226	-8%
MW-12B	512	296	-42%
MW-13B	ND	ND	-
MW-14B	ND	ND	-
MW15B	453	350	-23%
ERT-1	1,764	519	-71%
Total	7,244	4,929	-32%

Note: All analytical results are reported in micrograms per liter.

KEY:

VOC = Volatile Organic Compound
ND = Not Detected
NM = Not Measured

Table 9
Mohonk Road Contamiant Concentration Change
Pre-Pumping vs Post-Pumping Contamiant levels

Location	October 1999 Total VOC Levels	December 2000 Total VOC Levels	Change in Conc.
Mohonk Road Monitoring Wells			
MW-1B	ND	ND	-
MW-5B	3,330	2543	-787 (23.6%)
MW-5R	341	573	232 (40.5%)
MW-6B	67	31	-36 (53.7%)
MW-7B	NM	NM	-
MW-7R	532	391	-141 (26.5%)
MW-8B	ND	ND	-
MW-9B	ND	ND	-
MW-10B	ND	ND	-
MW-11B	245	226	-19 (7.8%)
MW-12B	512	296	-216 (42.2%)
MW-13B	ND	ND	-
MW-14B	ND	ND	-
MW15B	453	350	-103 (22.7%)
ERT-1	1,764	519	-1,245 (70.6%)
Total	7,244	4,929	-2,315 (32%)

Note: All chemical results are shown in parts per billion (ppb),

KEY

VOC = Volatile Organic Compound
ND = Not Detected
NM = Not Measured

Attachment 3

Mohonk Road Industrial Plant Superfund Site
Well Construction Details and December 2007 Water Level Data

Monitoring Well ID	Depth in Feet	Open-hole Interval	Sampling Interval (depth to pump intake or FLUTe sampling port) in feet	Inner Casing Elevation (ft AMSL)	Depth to Water (12/14/07)	Water Level Elevation (12/14/07)	Comments
MW-1B	100.00	22-100	90.00	333.53	61.39	272.14	
MW-5R	125.00	15-125	Extraction well sampling port	313.63	86.60	227.03	Extraction well
MW-6B	100.00	39-100	90.00	323.95	86.30	237.65	
MW-7B	100.00	24-100	90.00	313.93	87.07	226.86	
MW-7R	180.00	24-100	Extraction well sampling port	314.30	94.10	220.20	Extraction well
MW-11B	181.00	49-181	171.00	281.72	41.84	239.88	
ERT-1	195.00		Extraction well sampling port	303.94	81.90	222.04	Extraction well
ERT-2	200.00		190.00	309.81	76.41	233.40	
ERT-3	220.00		210.00	315.89	82.67	233.22	
MW-8B	100.00	48-100	90.00	159.68	31.05	128.63	
MW-9B	145.00	95-145	135.00	248.21	25.82	222.39	
MW-10B	100.00	24-100	90.00	225.64	27.77	197.87	
MW-12B	200.00	18-200	190.00	258.20	12.13	246.07	
MW-13B	200.00	78-200	NA	221.93	0.00	221.93	Artesian well
MW-14B	155.00	26-155	145.00	156.67	7.11	149.56	
MW-15B	150.00	38-142	140.00	244.89	16.08	228.81	
MW-16	93.00	73-93*	80.00	274.11	27.81	246.30	*No open-hole; well is screened 73-93
MW-17-1	57.00	37-57	47.00	241.92	7.17	234.75	FLUTe well with 20' spacer
MW-17-2	110.00	95-110	102.50	241.92	12.17	229.75	FLUTe well with 15' spacer
MW-17-3	129.00	119-129	124.00	241.92	12.21	229.71	FLUTe well with 10' spacer
MW-18-1	101.00	91-101	96.00	204.45	0.00	204.45	FLUTe well with 10' spacer
MW-18-2	128.00	118-128	123.00	204.45	0.00	204.45	FLUTe well with 10' spacer
MW-18-3	145.00	135-145	140.00	204.45	1.17	203.28	FLUTe well with 10' spacer
MW-19-1	49.00	34-49	41.50	129.88	1.50	128.38	FLUTe well with 15' spacer
MW-19-2	95.00	80-95	87.50	129.88	0.00	129.88	FLUTe well with 15' spacer
MW-19-3	195.00	180-195	187.50	129.88	0.00	129.88	FLUTe well with 15' spacer
MW-20-1	77.00	57-77	67.00	202.84	58.00	144.84	FLUTe well with 20' spacer
MW-20-2	111.50	86.5-111.5	97.50	202.84	56.67	146.17	FLUTe well with 25' spacer
MW-20-3	149.00	139-149	144.00	202.84	75.33	127.51	FLUTe well with 10' spacer
187 Mohonk Rd (RW-U6)	325.00	UNK	UNK	325.16	81.72	243.44	Private well
191 Mohonk Rd (RW-U1)	125.00	UNK	UNK	328.41	53.98	274.43	Private well
210 Mohonk Rd (RW-C30)	100.00	UNK	UNK	337.63	97.33	240.30	Private well
11 Canal Rd (GAC/RW-72)	205.00	UNK	UNK	211.65	23.98	187.67	Private well

Attachment 4

Attachment 4 describes the use of 1st order kinetics for the determination of chlorinated solvent rate constants and times to reach remediation goals.

The basic assumption of 1st order kinetics is that the rate of consumption of the contaminant is proportional to the concentration of the contaminant. It is assumed that any other reactant or process involved in the contaminant process remains constant. For other reactants, this basically equates to the assumption that the reactants are in excess so any changes in concentrations are insignificant.

The basic equation describing 1st order kinetics is:

$$d[C]/dt = -k [C]$$

where [C] is the contaminant concentration, t is time, and k is the rate constant. Rearranging the equation gives:

$$d[C]/[C] = -k\, dt$$

Integration from t(0) to t gives:

$$\ln \{[C]/[C(0)]\} = -k [t-t(0)]$$

where C(0) is the concentration at time t(0) (the start of the monitoring). Rearranging

$$\ln [C] = -k\{t - t(0)\} + \ln[C(0)]$$

The above equation was used to obtain rate constants for each monitoring or extraction well first by plotting the natural logarithm of the chlorinated solvent concentrations versus the difference between the sampling time and the time of the first recorded sampling event at each well [t – t(0)] and then doing ordinary regression fits. The rate constant k is the slope of each regression line. The regression lines on the Ln[C] vs. time graphs are included in Figure 5.

Half-lives (the time predicted for the contaminant to reach half its concentration at the first sampling event) were calculated by the following equation:

$$t_h = \ln(0.5)/k$$

Times to reach remediation goals were determined by the following equation:

$$t' = \ln\{[C(\text{April 2007})]/5 \text{ ppb}\}/k,$$

where [C(April 2007)] is the contaminant concentration from the April 2007 sampling round. This equation was used for all monitoring wells and extraction wells except ERT-4, which had apparent low concentrations for all chlorinated solvents in April 2007. For ERT-4, the concentrations from October 2006 were used instead.

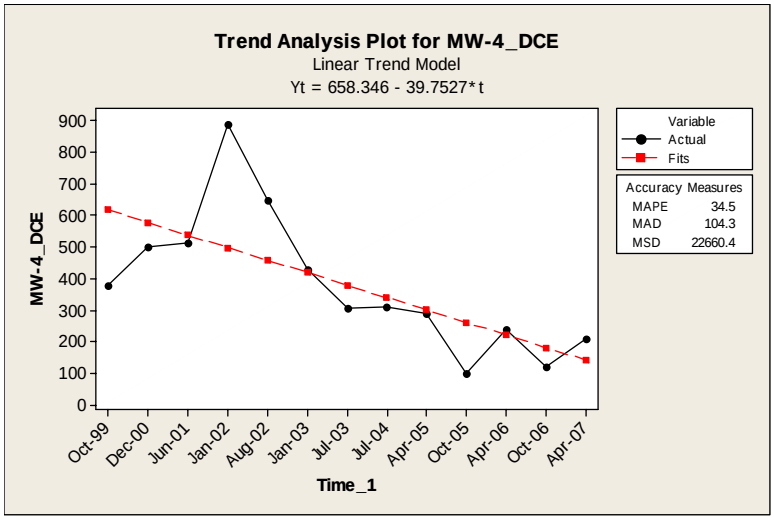
In addition to the kinetic calculations, the correlation coefficients of ln[C] vs. time regressions were calculated. The correlation coefficients are a measure of the fit of the regression line. A correlation coefficient of 1 represents a perfect linear relationship; a correlation of 0 indicates there is no relationship between time and contaminant concentration..

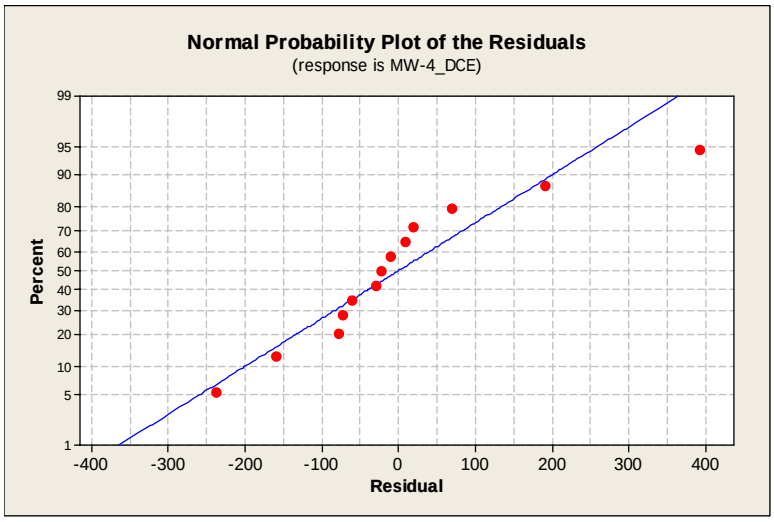
The regressions fits were done with the regression program in Excel; the results are displayed in Figure 5 of the report. The rate constants, half-lives, times to achieve remediation goals and correlation coefficients from the Excel linear regressions are listed for the various chlorinated solvents in Tables 1-4. In addition to the regressions performed in Excel, the statistical program MiniTab was used to determine if there were statistically significant trends. Both Kendall's tau and Pearson's R were calculated (as well as the non-parametric correlation coefficient Spearman's rho). The p-values associated with the correlation coefficient are also included (e.g., a p-value of 0.05 indicates that there is a

statistically significant trend at the 95% level of confidence). Time series plots were also used for qualitative evaluations of trends. The results are enclosed in Attachment 5. The results of the Mini-Tab analysis are captured in the tables by using a bold font for trends found to be statistically significant and italics for those that were not statistically significant. The results from the latter are of limited value in terms of predicting future concentrations or trends. However, they are included as the trends generally represent the slowest reaction rate constants.

Attachment 5

MW-4_DCE: Downward trend.



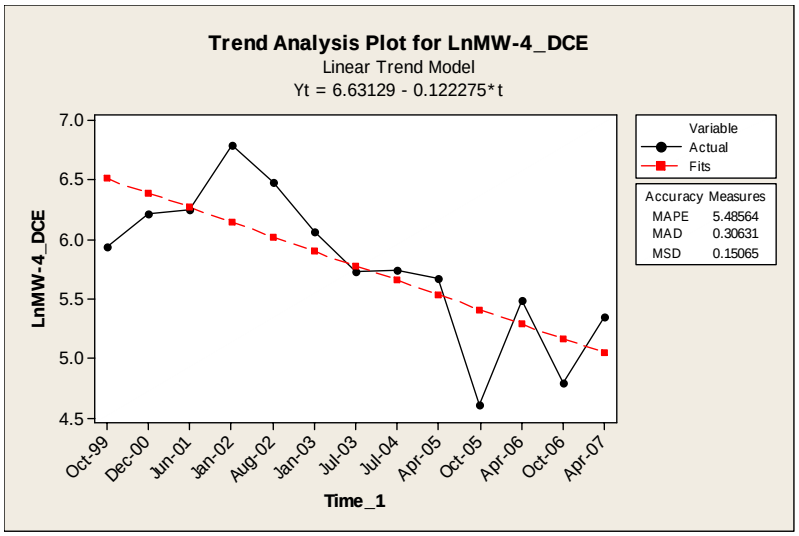


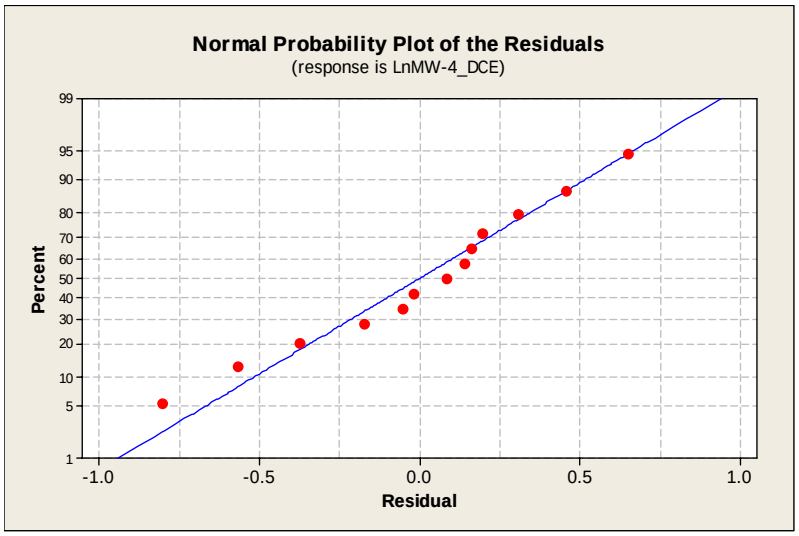
Descriptive Statistics: MW-4_DCE, Time_1

Variable	N	Mean	Median	TrMean	StDev	SE Mean
MW-4_DCE	13	380.1	310.0	359.1	220.3	61.1

Variable	Minimum	Maximum	Q1	Q3
MW-4_DCE	100.0	891.0	225.0	508.0

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.688040**	**0.0093311**
2	SPEARMAN'S RHO	-0.824176	0.0005302
3	**KENDALL'S TAU_A**	**-0.615385**	**0.0041384**
4	KENDALL'S TAU_B	-0.615385	0.0041384



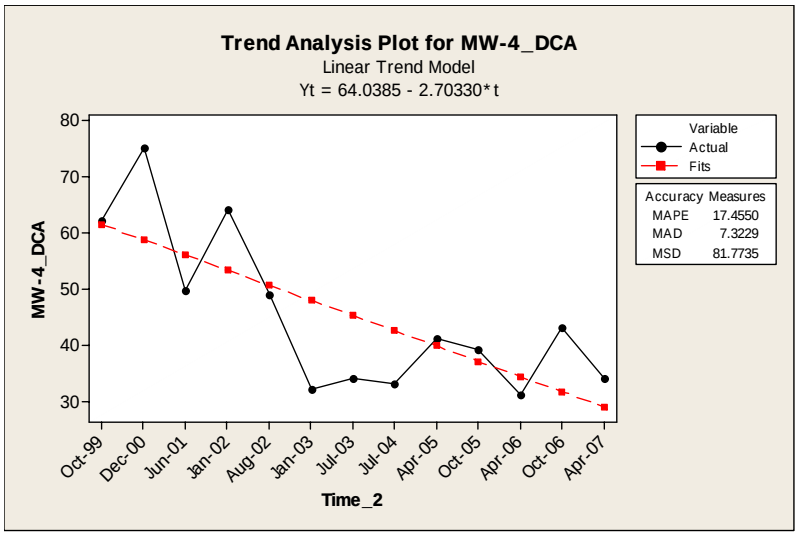


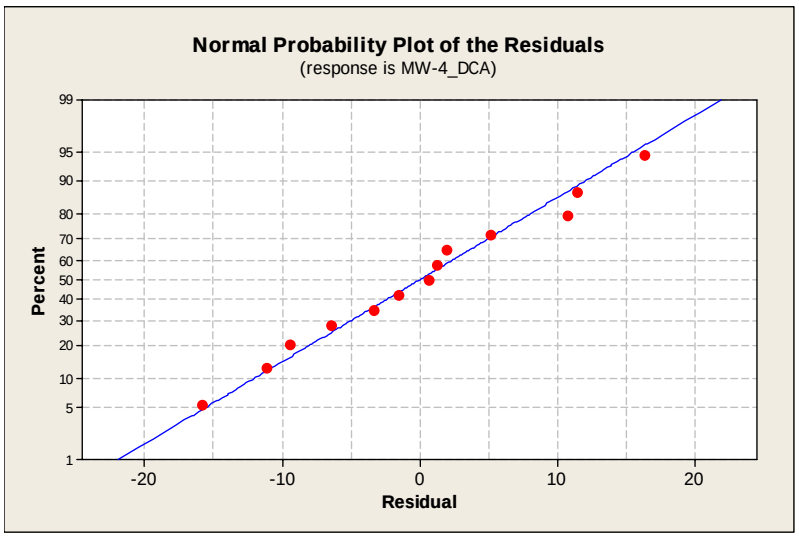
Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-4_D	13	5.775	5.737	5.789	0.624	0.173

Variable	Minimum	Maximum	Q1	Q3
LnMW-4_D	4.605	6.792	5.414	6.230

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.753677**	**0.0029268**
2	SPEARMAN'S RHO	-0.824176	0.0005302
3	**KENDALL'S TAU_A**	**-0.615385**	**0.0041384**
4	KENDALL'S TAU_B	-0.615385	0.0041384

MW-4_DCA: Downward trend.



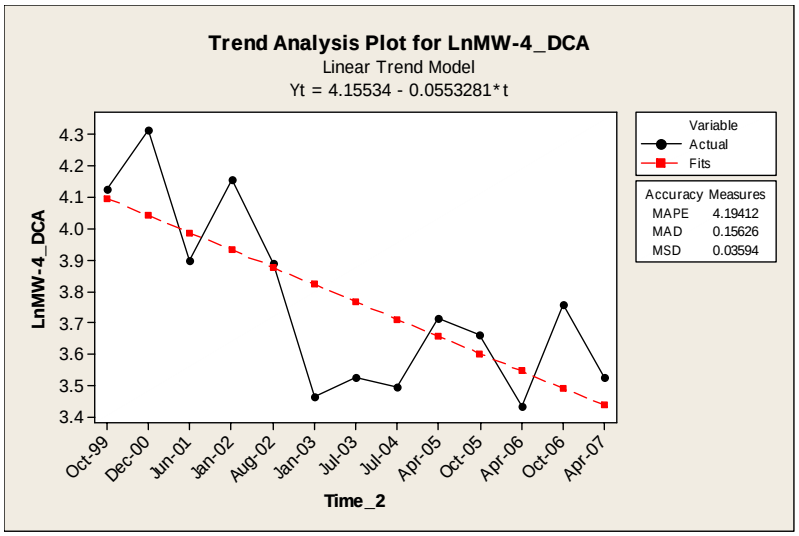


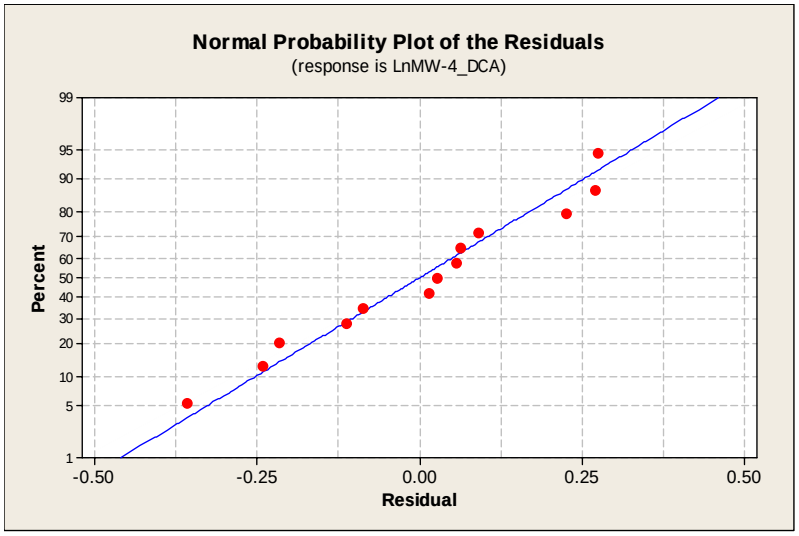
Descriptive Statistics: MW-4_DCA, Time_2

Variable	N	Mean	Median	TrMean	StDev	SE Mean
MW-4_DCA	13	45.12	41.00	43.68	14.12	3.92

Variable	Minimum	Maximum	Q1	Q3
MW-4_DCA	31.00	75.00	33.50	55.75

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.727779**	**0.0048020**
2	SPEARMAN'S RHO	-0.665750	0.0129950
3	**KENDALL'S TAU_A**	**-0.474359**	**0.0277772**
4	KENDALL'S TAU_B	-0.477429	0.0277772





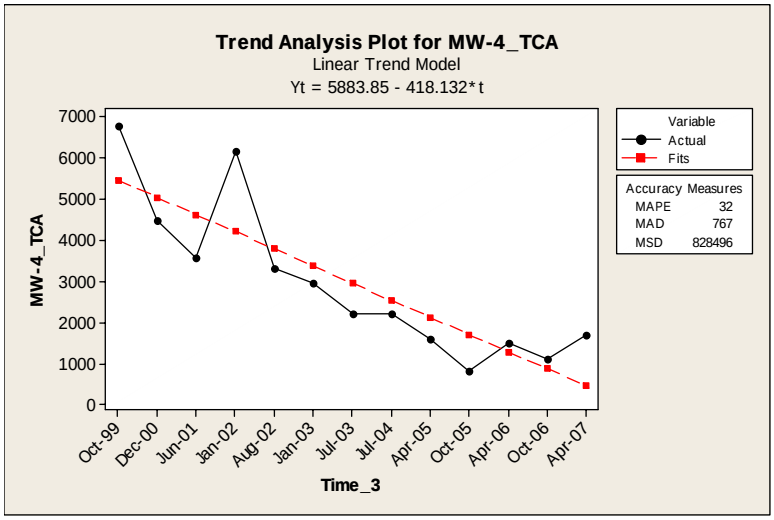
Descriptive Statistics: LnMW-4_DCA, Time_2

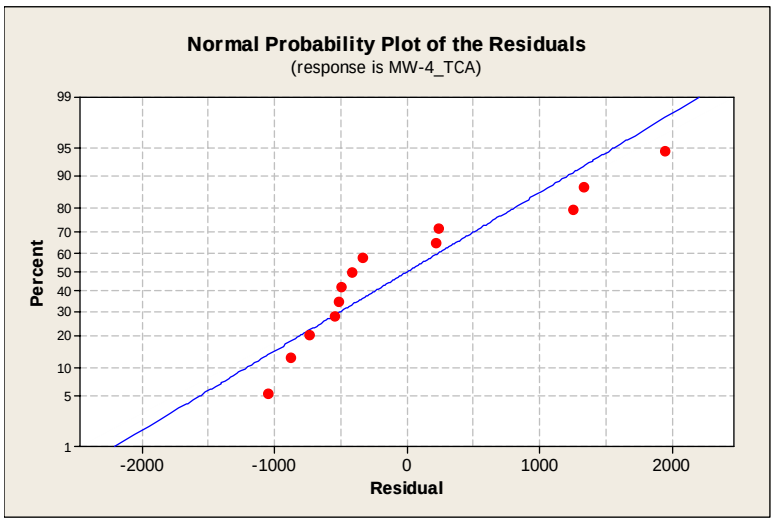
Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-4_D	13	3.7680	3.7136	3.7485	0.2922	0.0810

Variable	Minimum	Maximum	Q1	Q3
LnMW-4_D	3.4340	4.3175	3.5114	4.0146

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.719508**	**0.0055625**
2	SPEARMAN'S RHO	-0.665750	0.0129950
3	**KENDALL'S TAU_A**	**-0.474359**	**0.0277772**
4	KENDALL'S TAU_B	-0.477429	0.0277772

MW-4_TCA: Downward trend



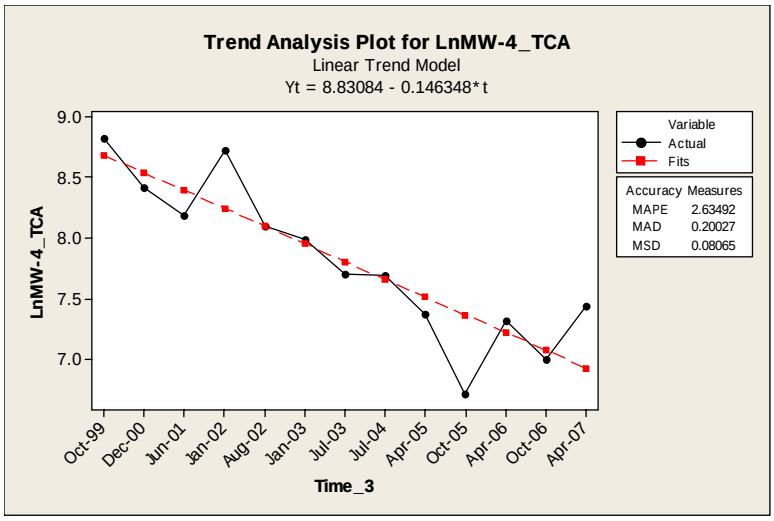


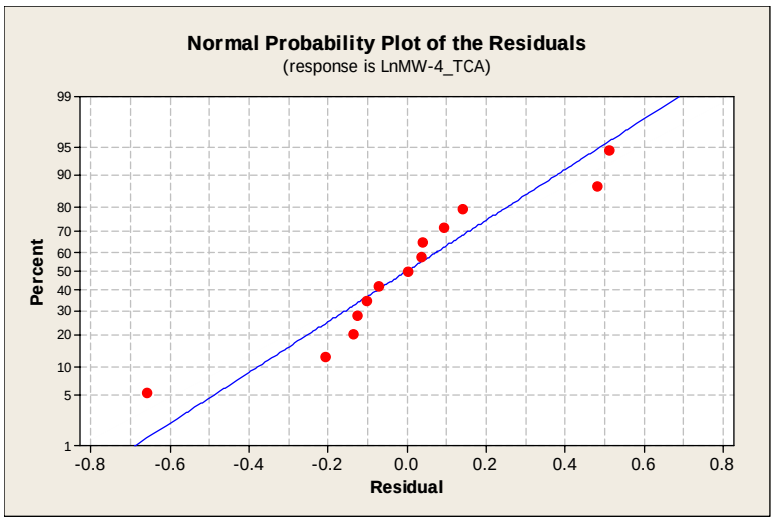
Descriptive Statistics: MW-4_TCA, Time_3

Variable	N	Mean	Median	TrMean	StDev	SE Mean
MW-4_TCA	13	2957	2220	2802	1884	523

Variable	Minimum	Maximum	Q1	Q3
MW-4_TCA	820	6800	1550	4040

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.877452**	**0.0000811**
2	SPEARMAN'S RHO	-0.912088	0.0000140
3	**KENDALL'S TAU_A**	**-0.794872**	**0.0001980**
4	KENDALL'S TAU_B	-0.794872	0.0001980





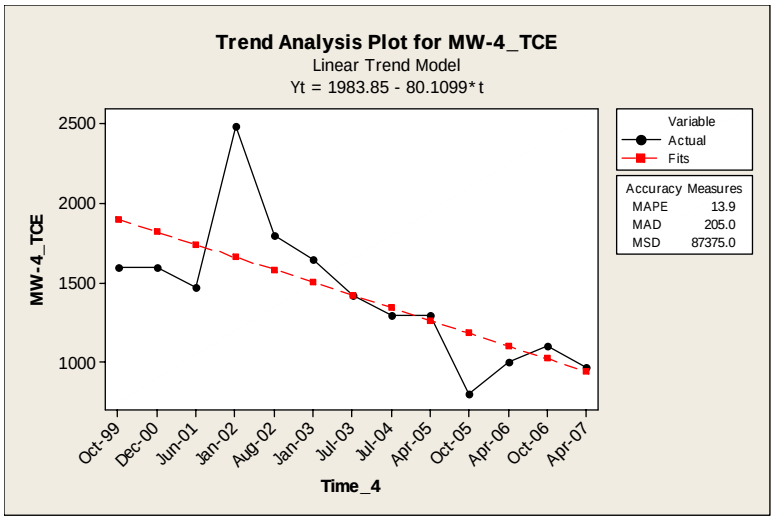
Descriptive Statistics: LnMW-4_TCA, Time_3

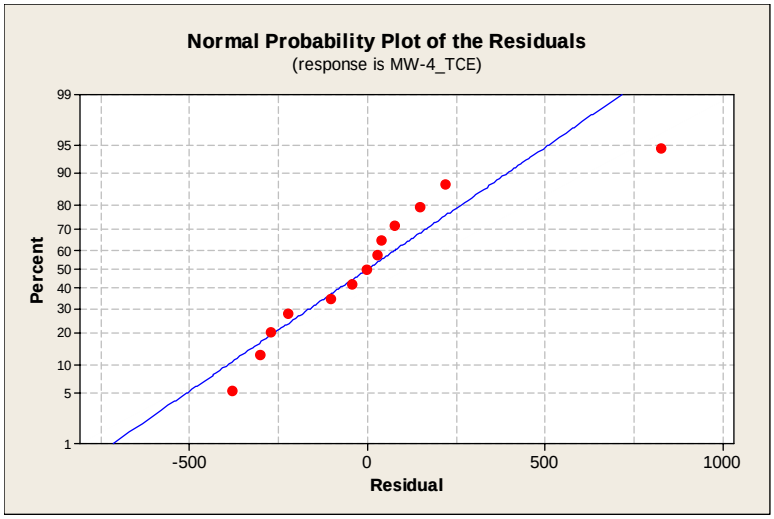
Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-4_T	13	7.806	7.705	7.814	0.642	0.178

Variable	Minimum	Maximum	Q1	Q3
LnMW-4_T	6.709	8.825	7.345	8.297

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.898897**	**0.0000294**
2	SPEARMAN'S RHO	-0.912088	0.0000140
3	**KENDALL'S TAU_A**	**-0.794872**	**0.0001980**
4	KENDALL'S TAU_B	-0.794872	0.0001980

MW-4_TCE: Downward trend



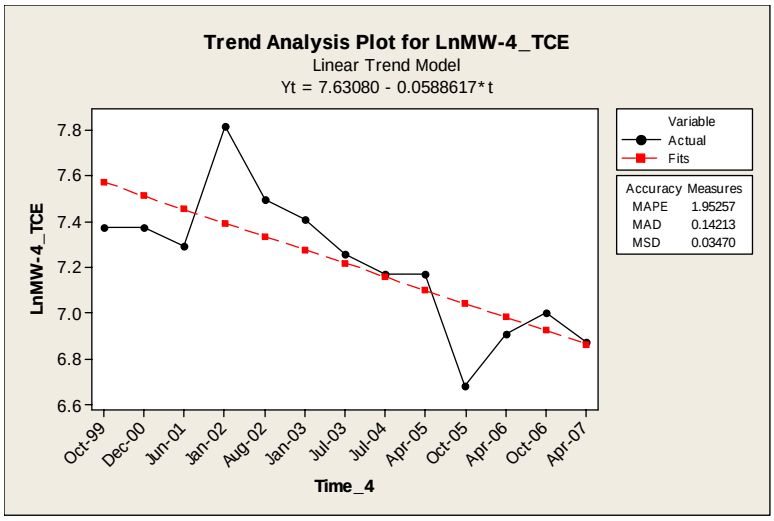


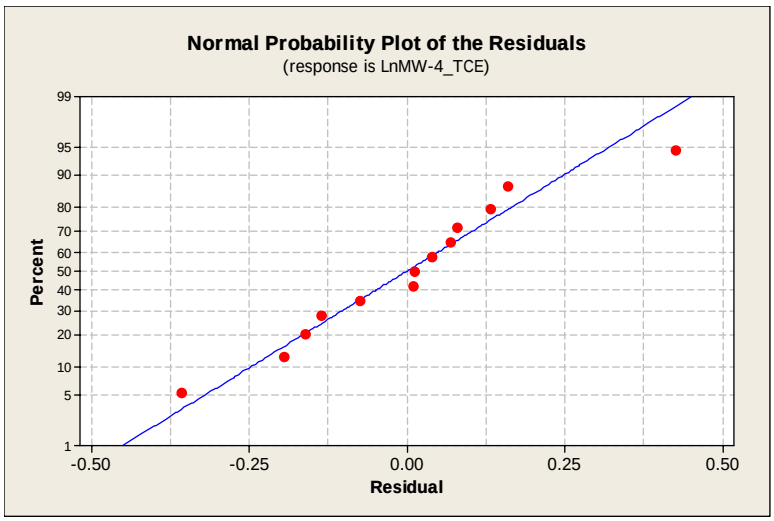
Descriptive Statistics: MW-4_TCE, Time_4

Variable	N	Mean	Median	TrMean	StDev	SE Mean
MW-4_TCE	13	1423	1420	1383	438	122

Variable	Minimum	Maximum	Q1	Q3
MW-4_TCE	800	2490	1050	1625

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.709004**	**0.0066580**
2	SPEARMAN'S RHO	-0.809920	0.0007907
3	**KENDALL'S TAU_A**	**-0.641026**	**0.0026943**
4	KENDALL'S TAU_B	-0.649405	0.0026943





Descriptive Statistics: LnMW-4_TCE, Time_4

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-4_T	13	7.2188	7.2584	7.2127	0.3002	0.0833

Variable	Minimum	Maximum	Q1	Q3
LnMW-4_T	6.6846	7.8200	6.9554	7.3931

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.762988**	**0.0024145**
2	SPEARMAN'S RHO	-0.809920	0.0007907
3	**KENDALL'S TAU_A**	**-0.641026**	**0.0026943**
4	KENDALL'S TAU_B	-0.649405	0.0026943

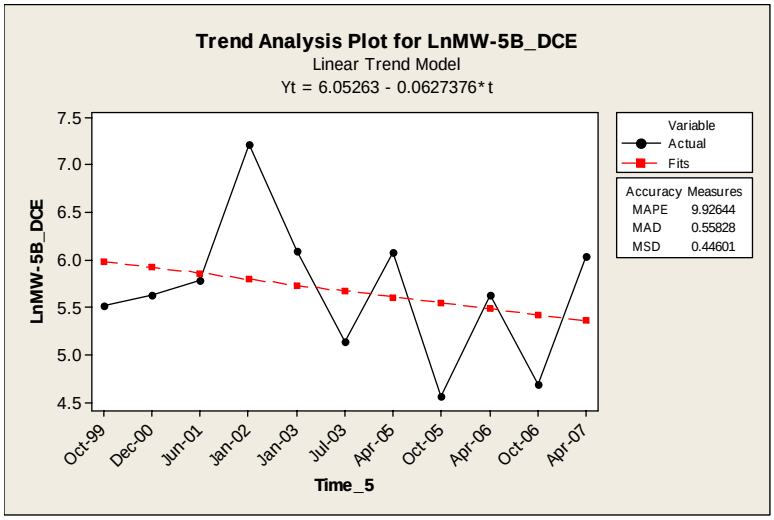
MW-5B_DCE: No statistical trend but weak apparent trend

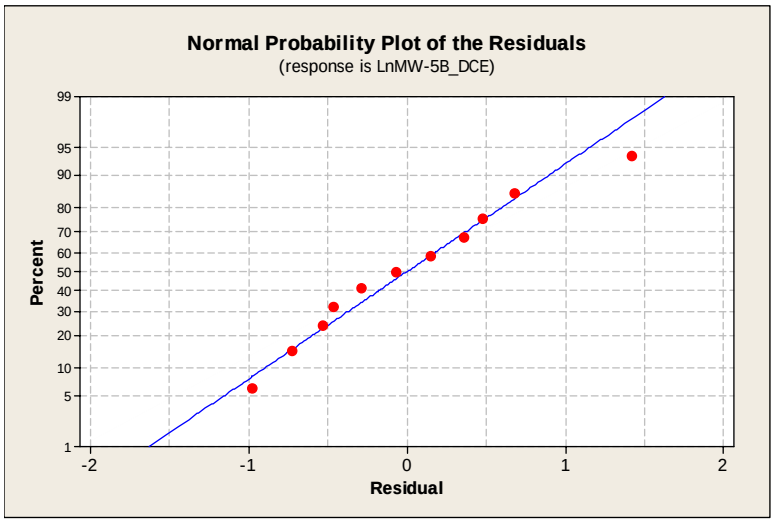
Descriptive Statistics: LnMW-5B_DCE, Time_5

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-5B_	11	5.676	5.635	5.628	0.731	0.220
Time_5	11	37915	37803	37939	944	285

Variable	Minimum	Maximum	Q1	Q3
LnMW-5B_	4.575	7.215	5.142	6.087
Time_5	36434	39173	37043	38808

Row	CORRTYPE	CORR_VAL	P_VALUE
1	PEARSON'S R	-0.304054	0.363331
2	SPEARMAN'S RHO	-0.177677	0.601210
3	KENDALL'S TAU_A	-0.109091	0.696215
4	KENDALL'S TAU_B	-0.110096	0.696215





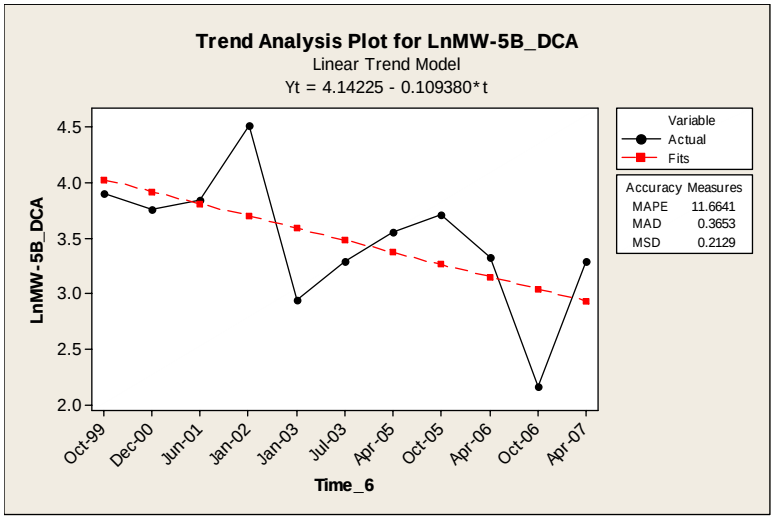
MW-5B_DCA: Downward trend at 90% CL

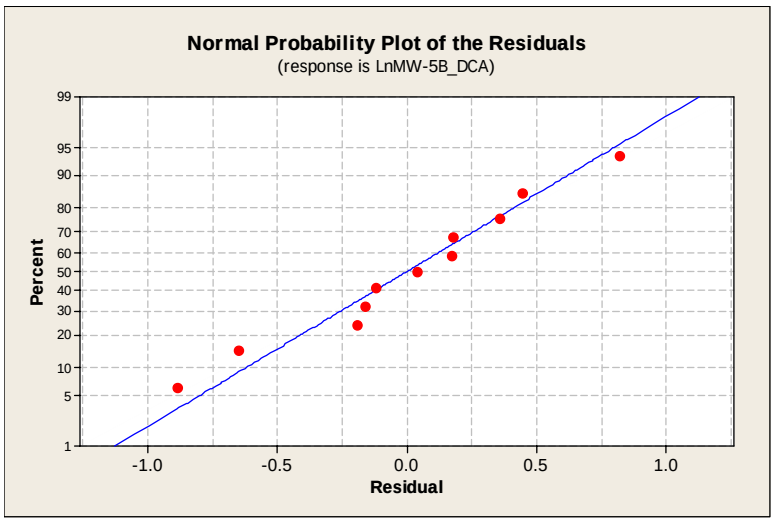
Descriptive Statistics: LnMW-5B_DCA, Time_6

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-5B_	11	3.486	3.555	3.518	0.605	0.182

Variable	Minimum	Maximum	Q1	Q3
LnMW-5B_	2.163	4.522	3.296	3.850

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.585027**	**0.0586787**
2	SPEARMAN'S RHO	-0.697041	0.0171330
3	**KENDALL'S TAU_A**	**-0.472727**	**0.0509178**
4	KENDALL'S TAU_B	-0.477084	0.0509178





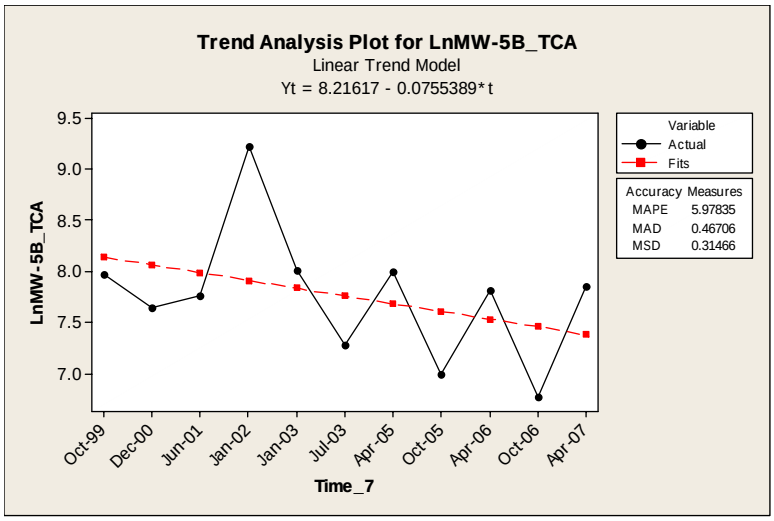
MW-5B_TCA: No statistical trend but apparent downward trend

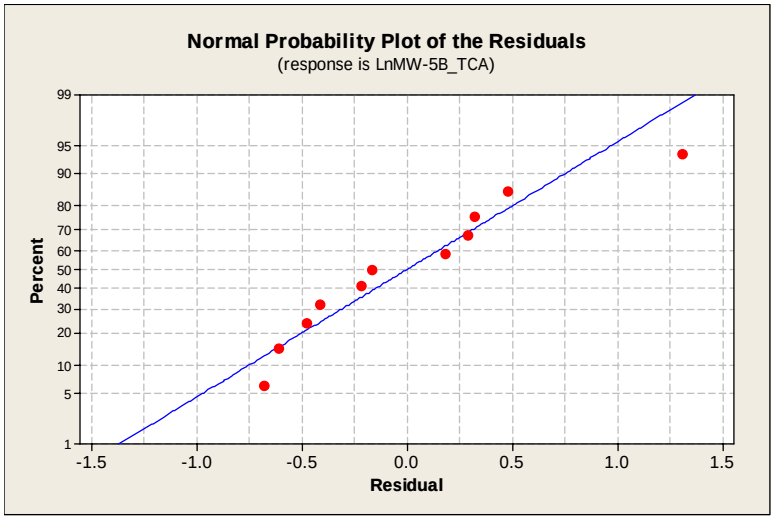
Descriptive Statistics: LnMW-5B_TCA, Time_7

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-5B_	11	7.763	7.824	7.710	0.639	0.193

Variable	Minimum	Maximum	Q1	Q3
LnMW-5B_	6.780	9.220	7.286	8.006

Row	CORRTYPE	CORR_VAL	P_VALUE
1	PEARSON'S R	-0.408390	0.212406
2	SPEARMAN'S RHO	-0.300000	0.370083
3	KENDALL'S TAU_A	-0.236364	0.350201
4	KENDALL'S TAU_B	-0.236364	0.350201





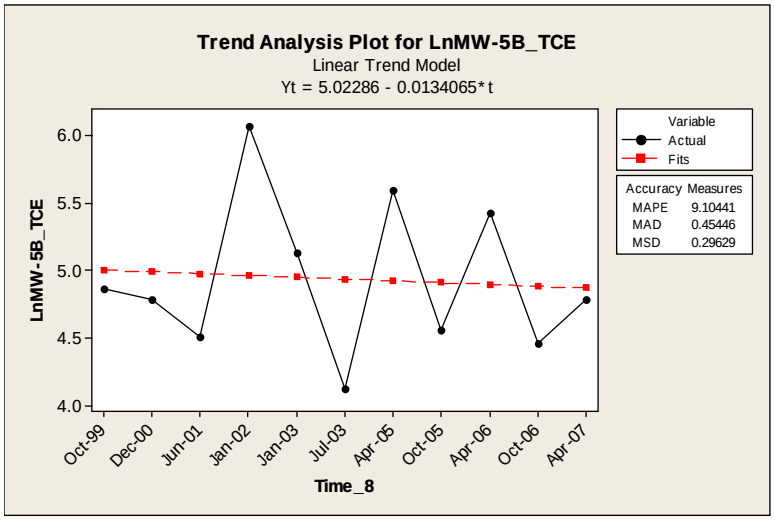
MW-5B_TCE: No trend

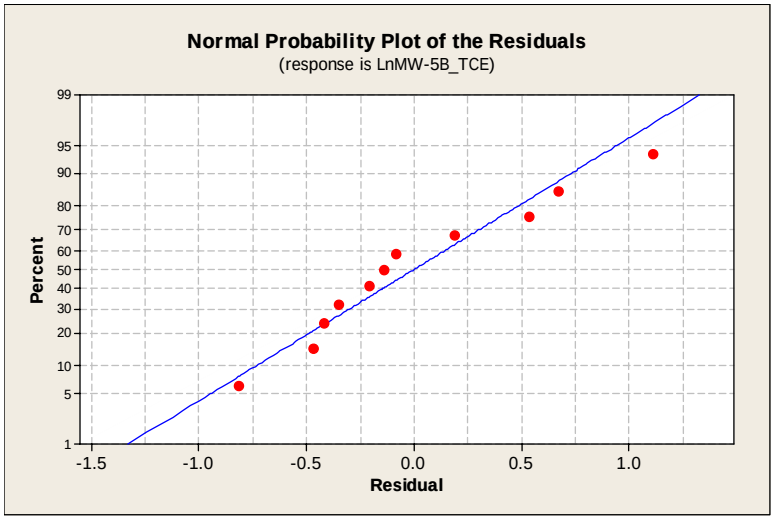
Descriptive Statistics: LnMW-5B_TCE, Time_8

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-5B_	11	4.942	4.787	4.907	0.573	0.173

Variable	Minimum	Maximum	Q1	Q3
LnMW-5B_	4.127	6.078	4.511	5.438

Row	CORRTYPE	CORR_VAL	P_VALUE
1	PEARSON'S R	-0.046407	0.892225
2	SPEARMAN'S RHO	-0.141230	0.678724
3	KENDALL'S TAU_A	-0.109091	0.696215
4	KENDALL'S TAU_B	-0.110096	0.696215





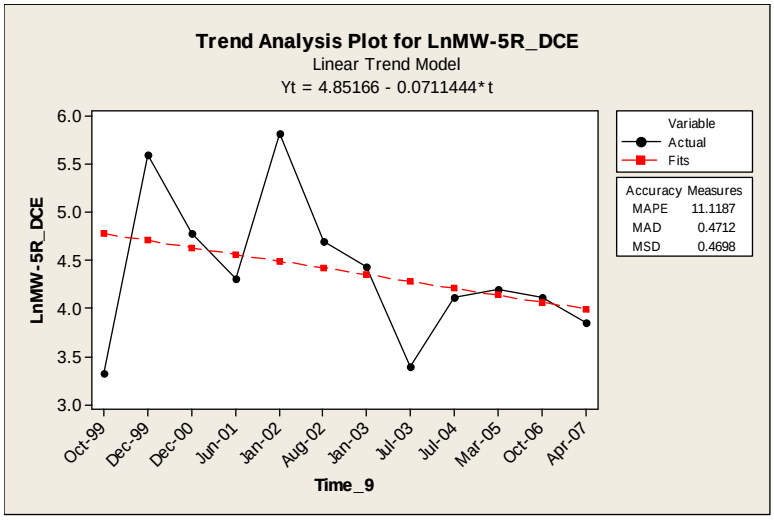
MW-5R_DCE: No statistical trend but there is an apparent downward tend

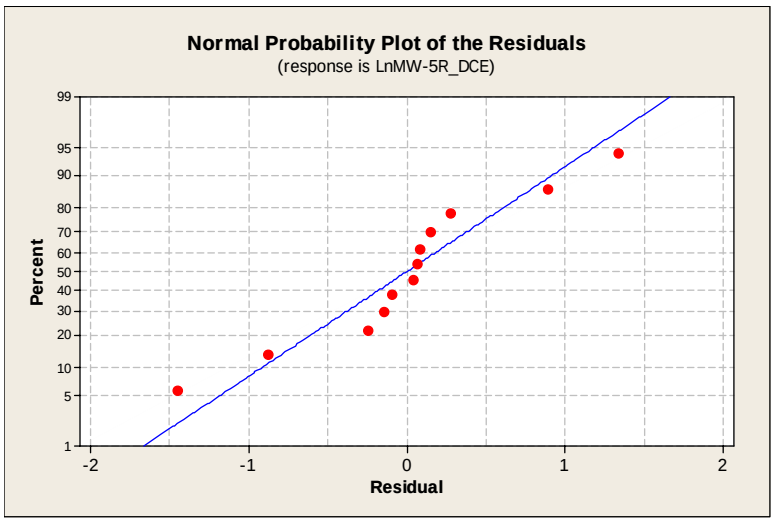
Descriptive Statistics: LnMW-5R_DCE, Time_9

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-5R_	12	4.389	4.261	4.351	0.760	0.220

Variable	Minimum	Maximum	Q1	Q3
LnMW-5R_	3.332	5.826	3.915	4.766

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.348523**	**0.266889**
2	SPEARMAN'S RHO	-0.378284	0.225327
3	**KENDALL'S TAU_A**	**-0.348485**	**0.130494**
4	KENDALL'S TAU_B	-0.351155	0.130494





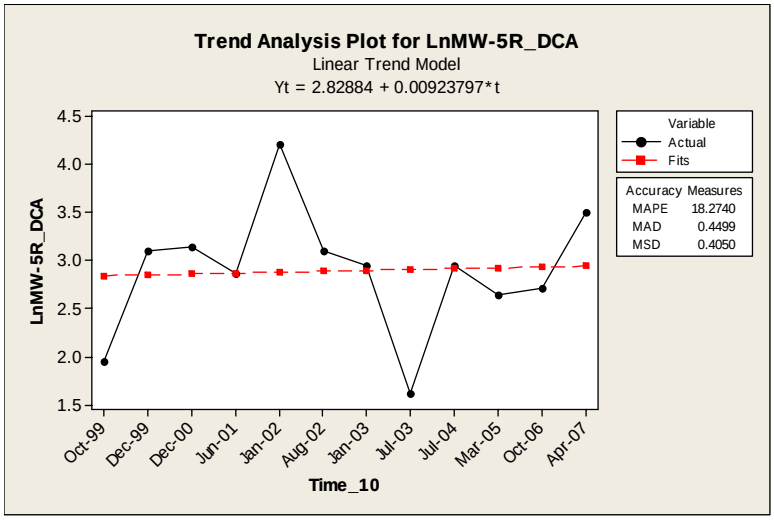
MW-5R_DCA: No trend

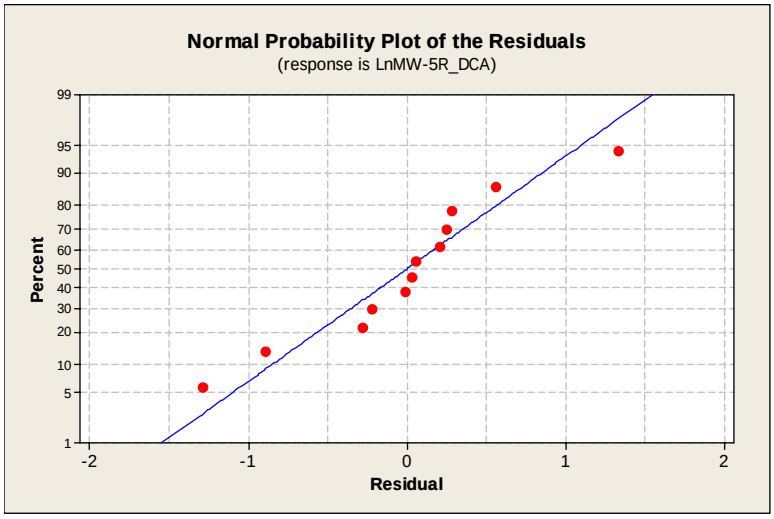
Descriptive Statistics: LnMW-5R_DCA, Time_10

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-5R_	12	2.889	2.944	2.885	0.665	0.192

Variable	Minimum	Maximum	Q1	Q3
LnMW-5R_	1.609	4.205	2.656	3.124

Row	CORRTYPE	CORR_VAL	P_VALUE
1	PEARSON'S R	0.0768912	0.812259
2	SPEARMAN'S RHO	-0.0631583	0.845395
3	KENDALL'S TAU_A	-0.0606061	0.836251
4	KENDALL'S TAU_B	-0.0615457	0.836251





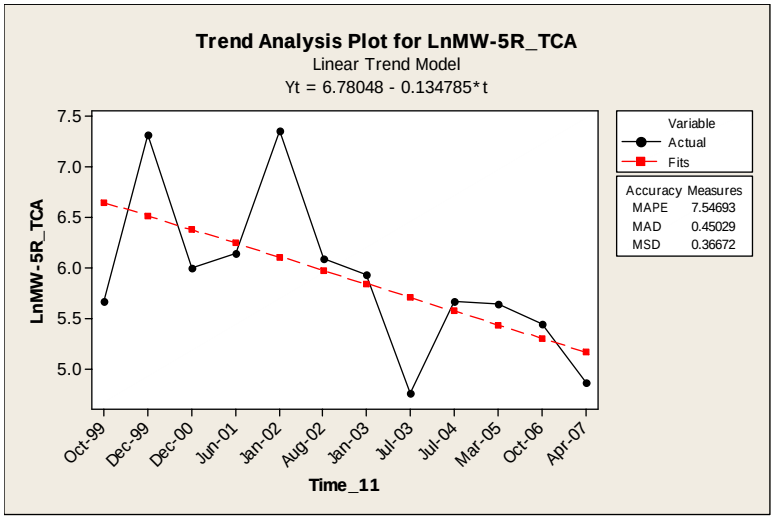
MW-54_TCA: Downward trend

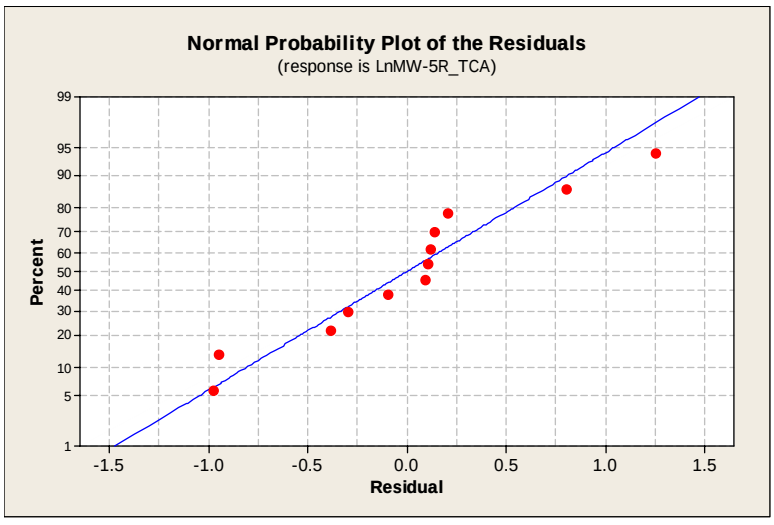
Descriptive Statistics: LnMW-5R_TCA, Time_11

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-5R_	12	5.904	5.797	5.874	0.798	0.230

Variable	Minimum	Maximum	Q1	Q3
LnMW-5R_	4.754	7.359	5.487	6.130

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.614119**	**0.0336364**
2	SPEARMAN'S RHO	-0.686516	0.0136736
3	**KENDALL'S TAU_A**	**-0.530303**	**0.0194409**
4	KENDALL'S TAU_B	-0.534367	0.0194409





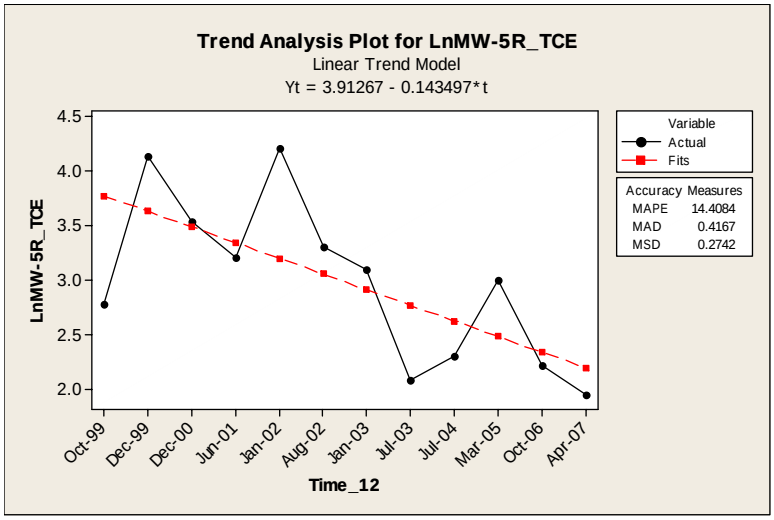
MW-5R_TCE: Downward trend

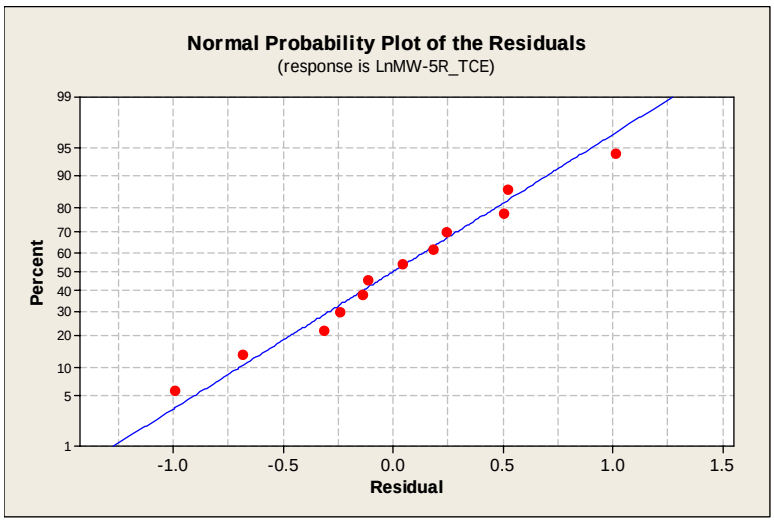
Descriptive Statistics: LnMW-5R_TCE, Time_12

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-5R_	12	2.980	3.043	2.961	0.753	0.217

Variable	Minimum	Maximum	Q1	Q3
LnMW-5R_	1.946	4.205	2.240	3.469

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.701584**	**0.0109959**
2	SPEARMAN'S RHO	-0.685315	0.0139060
3	**KENDALL'S TAU_A**	**-0.545455**	**0.0163933**
4	KENDALL'S TAU_B	-0.545455	0.0163933





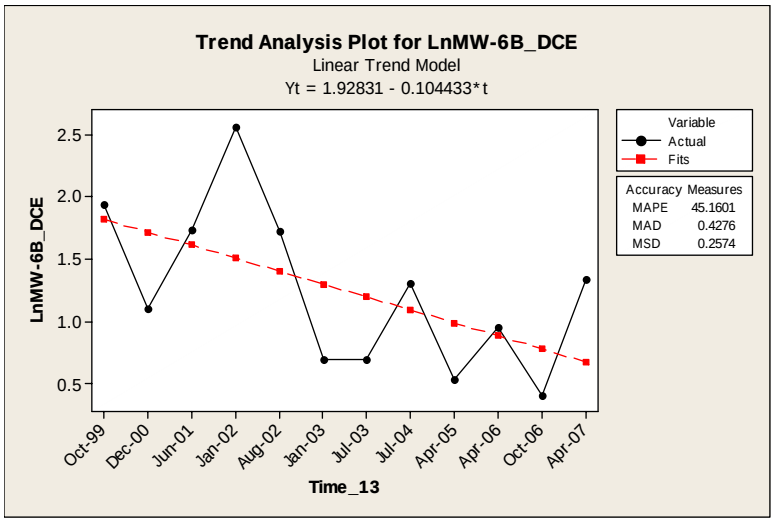
MW-6B_DCE: Downward trend at 90% - 95% CL

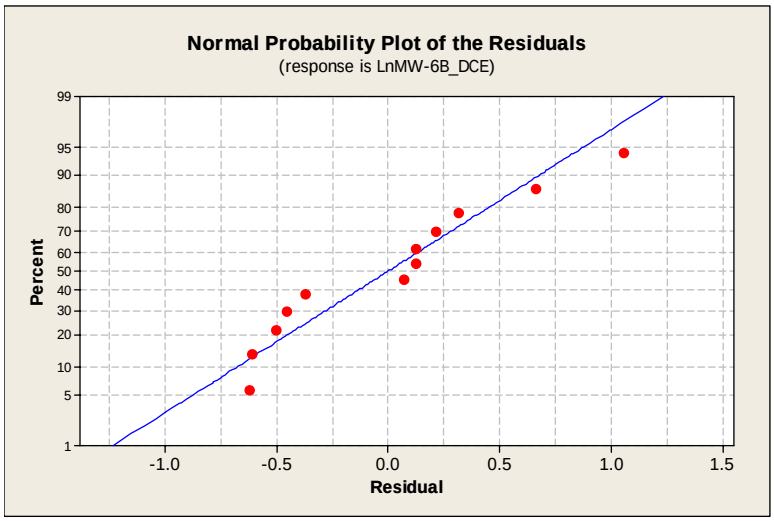
Descriptive Statistics: LnMW-6B_DCE, Time_13

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-6B_	12	1.249	1.203	1.202	0.650	0.188

Variable	Minimum	Maximum	Q1	Q3
LnMW-6B_	0.405	2.565	0.693	1.736

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.565889**	**0.0551277**
2	SPEARMAN'S RHO	-0.591945	0.0425902
3	**KENDALL'S TAU_A**	**-0.439394**	**0.0542842**
4	KENDALL'S TAU_B	-0.442761	0.0542842





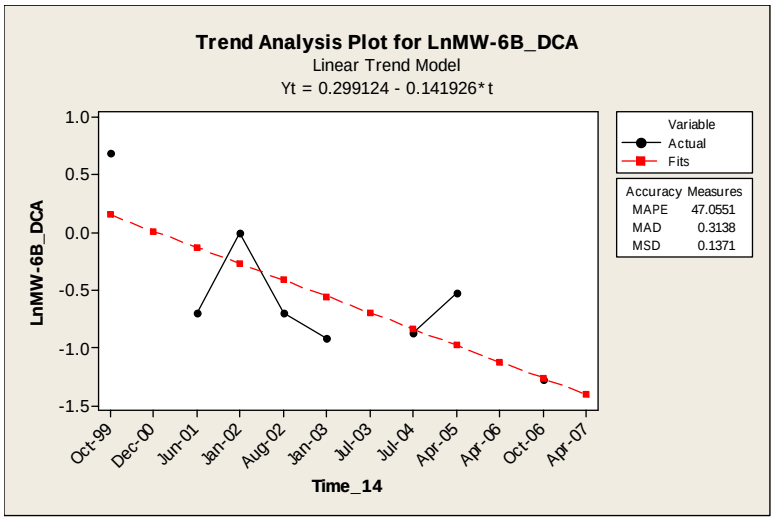
MW-6B_DCA: Downward Trend

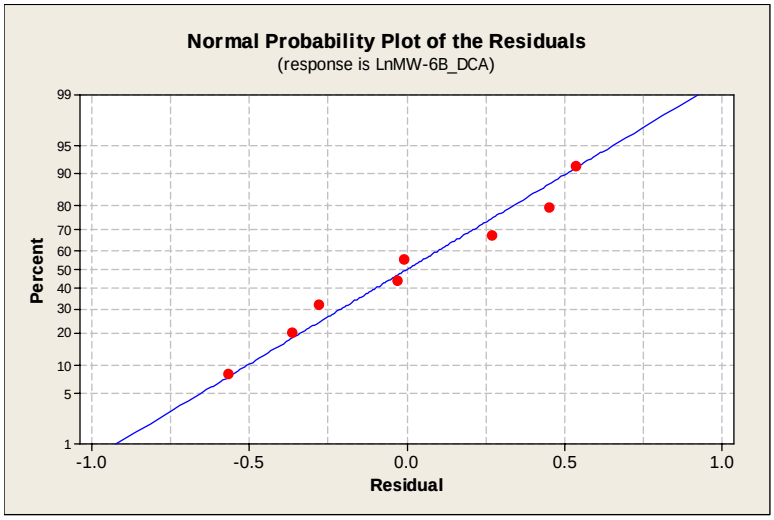
Descriptive Statistics: LnMW-6B_DCA, Time_14

Variable	N	N*	Mean	Median	TrMean	StDev
LnMW-6B_	8	4	-0.535	-0.693	-0.535	0.615

Variable	SE Mean	Minimum	Maximum	Q1	Q3
LnMW-6B_	0.217	-1.273	0.693	-0.904	-0.132

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.770727**	**0.0251865**
2	SPEARMAN'S RHO	-0.670671	0.0686927
3	**KENDALL'S TAU_A**	**-0.535714**	**0.0809048**
4	KENDALL'S TAU_B	-0.545545	0.0809048





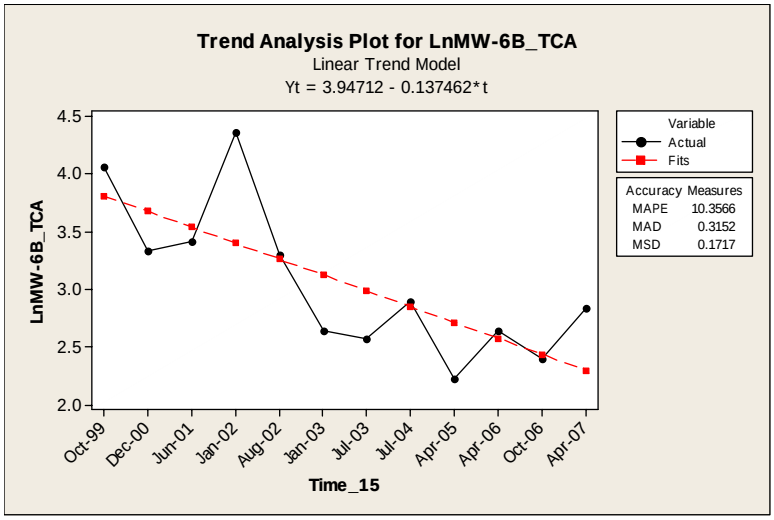
MW-6B_TCA: Downward trend

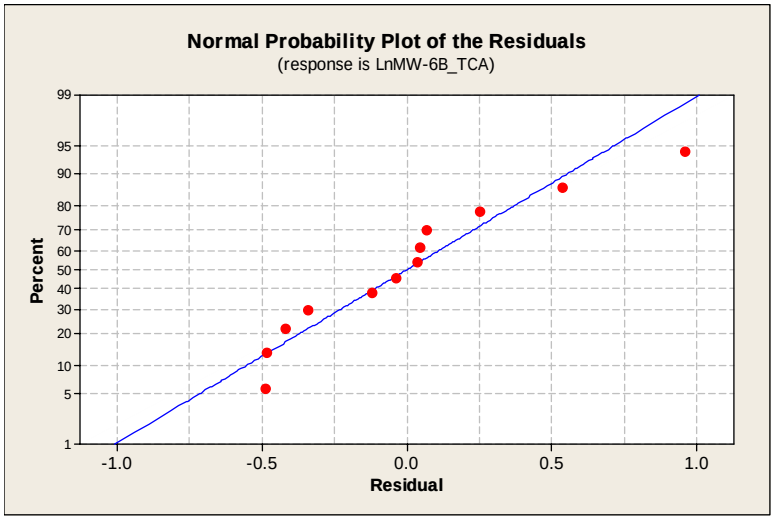
Descriptive Statistics: LnMW-6B_TCA, Time_15

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-6B_	12	3.054	2.862	3.007	0.658	0.190

Variable	Minimum	Maximum	Q1	Q3
LnMW-6B_	2.219	4.357	2.583	3.394

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.737806**	**0.0061593**
2	SPEARMAN'S RHO	-0.756569	0.0043985
3	**KENDALL'S TAU_A**	**-0.560606**	**0.0133447**
4	KENDALL'S TAU_B	-0.564902	0.0133447





MW-6B_TCE: No enough detects for trend evaluation.

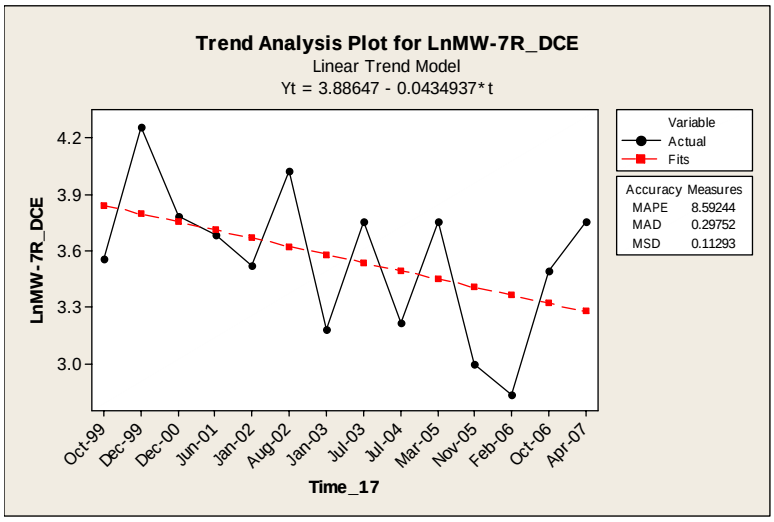
MW-7R_DCE: Downward trend at about 90% CL

Descriptive Statistics: LnMW-7R_DCE, Time_17

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-7R_	14	3.560	3.620	3.562	0.393	0.105

Variable	Minimum	Maximum	Q1	Q3
LnMW-7R_	2.833	4.263	3.209	3.767

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.481932**	**0.080975**
2	SPEARMAN'S RHO	-0.443713	0.112000
3	**KENDALL'S TAU_A**	**-0.329670**	**0.110400**
4	KENDALL'S TAU_B	-0.335243	0.110400



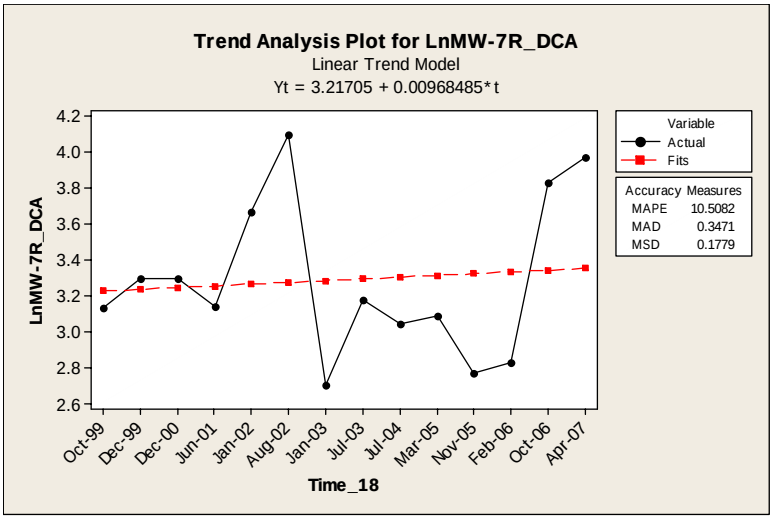
MW-7R_DCA: No trend

Descriptive Statistics: LnMW-7R_DCA, Time_18

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-7R_	14	3.290	3.161	3.271	0.440	0.117

Variable	Minimum	Maximum	Q1	Q3
LnMW-7R_	2.708	4.094	2.992	3.705

Row	CORRTYPE	CORR_VAL	P_VALUE
1	PEARSON'S R	0.0819149	0.780714
2	SPEARMAN'S RHO	-0.0616062	0.834280
3	KENDALL'S TAU_A	-0.0219780	0.956276
4	KENDALL'S TAU_B	-0.0220998	0.956276



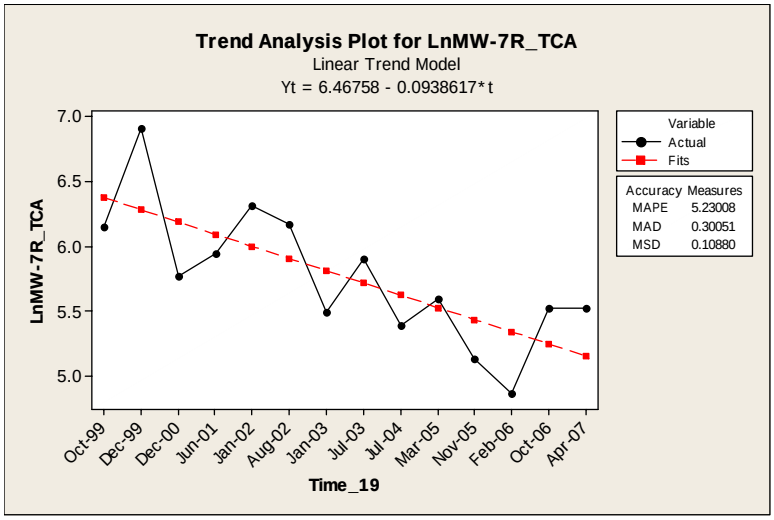
MW-7R_TCA: Downward Trend

Descriptive Statistics: LnMW-7R_TCA, Time_19

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-7R_	14	5.764	5.683	5.743	0.521	0.139

Variable	Minimum	Maximum	Q1	Q3
LnMW-7R_	4.868	6.908	5.471	6.158

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.773174**	**0.0011821**
2	SPEARMAN'S RHO	-0.739274	0.0025163
3	**KENDALL'S TAU_A**	**-0.549451**	**0.0072199**
4	KENDALL'S TAU_B	-0.552495	0.0072199



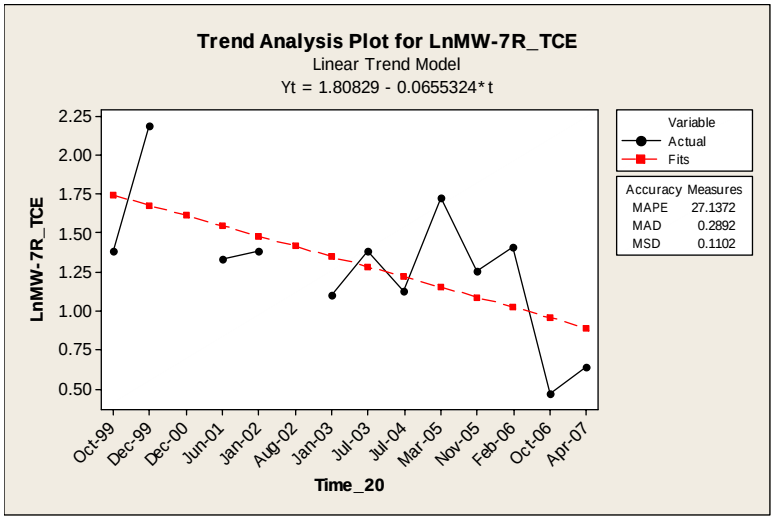
MW-7R_TCE: Downward trend

Descriptive Statistics: LnMW-7R_TCE, Time_20

Variable	N	N*	Mean	Median	TrMean	StDev
LnMW-7R_	12	2	1.284	1.361	1.275	0.446

Variable	SE Mean	Minimum	Maximum	Q1	Q3
LnMW-7R_	0.129	0.470	2.186	1.107	1.405

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.631052**	**0.027773**
2	SPEARMAN'S RHO	-0.464800	0.127893
3	**KENDALL'S TAU_A**	**-0.318182**	**0.166533**
4	KENDALL'S TAU_B	-0.325669	0.166533



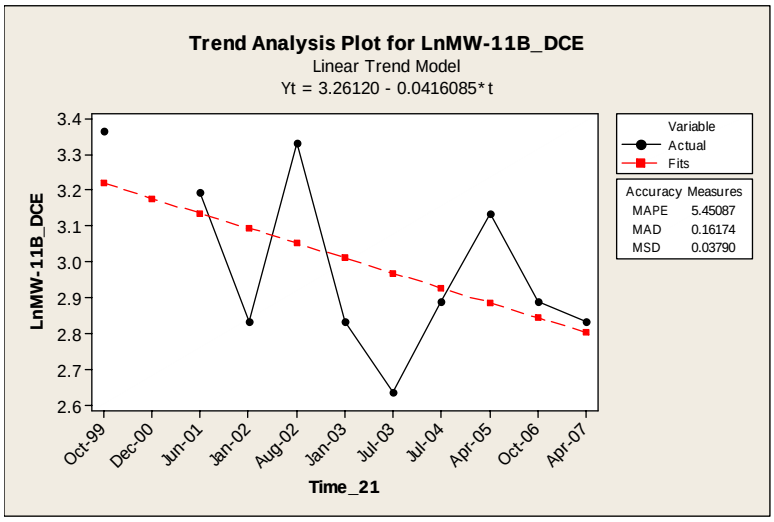
MW-11B_DCE: Downward trend at about 80% CL

Descriptive Statistics: LnMW-11B_DCE, Time_21

Variable	N	N*	Mean	Median	TrMean	StDev
LnMW-11B	10	1	2.9949	2.8904	2.9928	0.2447

Variable	SE Mean	Minimum	Maximum	Q1	Q3
LnMW-11B	0.0774	2.6391	3.3673	2.8332	3.2290

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.499811**	**0.141288**
2	SPEARMAN'S RHO	-0.449284	0.192705
3	**KENDALL'S TAU_A**	**-0.333333**	**0.201868**
4	KENDALL'S TAU_B	-0.349215	0.201868



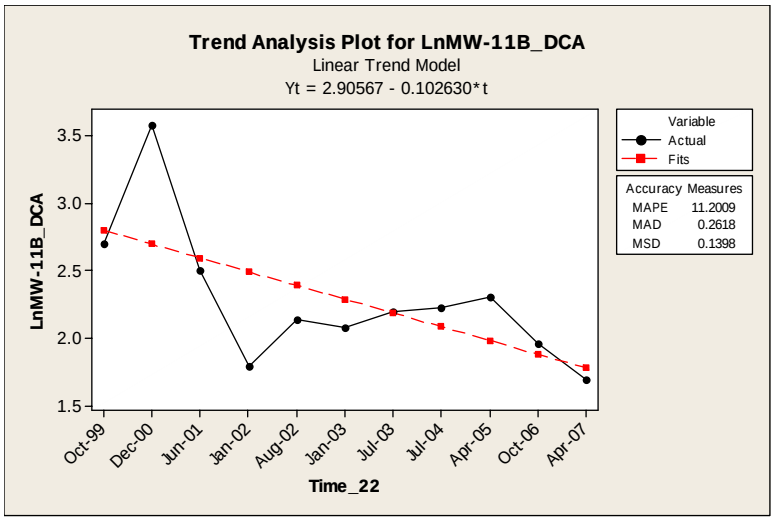
MW-11B_DCA: Downward trend

Descriptive Statistics: LnMW-11B_DCA, Time_22

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-11B	11	2.290	2.197	2.213	0.519	0.157

Variable	Minimum	Maximum	Q1	Q3
LnMW-11B	1.686	3.584	1.960	2.510

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.625836**	**0.0394297**
2	SPEARMAN'S RHO	-0.627273	0.0388453
3	**KENDALL'S TAU_A**	**-0.418182**	**0.0867682**
4	KENDALL'S TAU_B	-0.418182	0.0867682



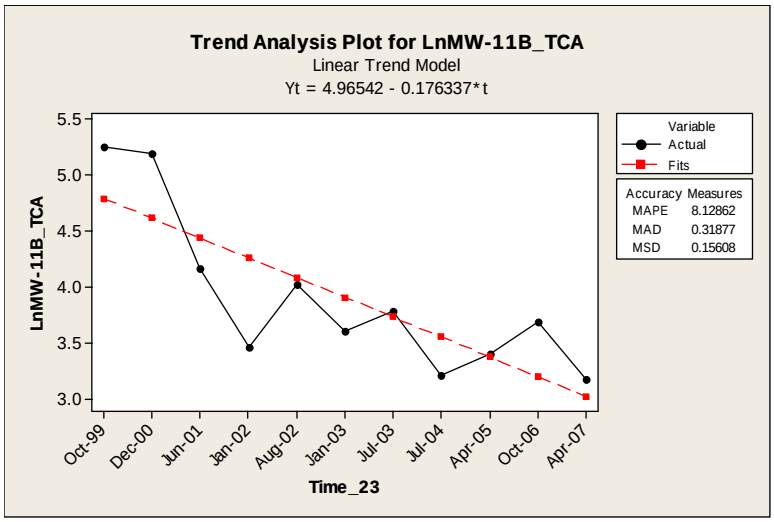
MW-11B_TCA: Downward trend

Descriptive Statistics: LnMW-11B_TCA, Time_23

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-11B	11	3.907	3.689	3.840	0.717	0.216

Variable	Minimum	Maximum	Q1	Q3
LnMW-11B	3.178	5.247	3.401	4.168

Row	CORRTYPE	CORR_VAL	P_VALUE
1	PEARSON'S R	-0.772601	0.0053117
2	SPEARMAN'S RHO	-0.809091	0.0025586
3	KENDALL'S TAU_A	-0.672727	0.0050693
4	KENDALL'S TAU_B	-0.672727	0.0050693



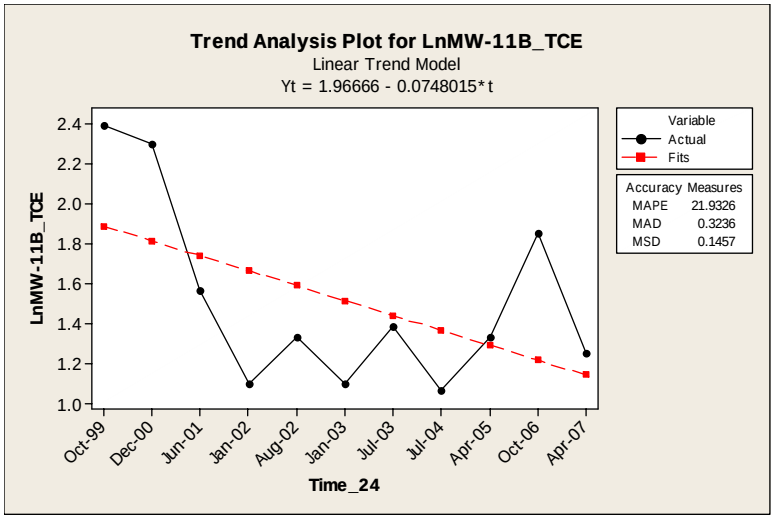
MW-11B_TCE: Downward trend at about 80% CL

Descriptive Statistics: LnMW-11B_TCE, Time_24

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-11B	11	1.518	1.335	1.470	0.471	0.142

Variable	Minimum	Maximum	Q1	Q3
LnMW-11B	1.065	2.398	1.099	1.856

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.453601**	**0.161125**
2	SPEARMAN'S RHO	-0.438361	0.177453
3	**KENDALL'S TAU_A**	**-0.345455**	**0.158578**
4	KENDALL'S TAU_B	-0.351912	0.158578



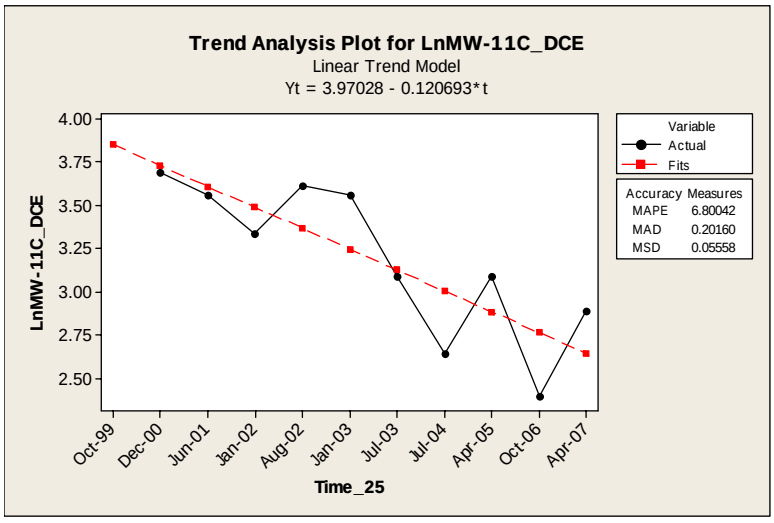
MW-11C_DCE: Downward trend

Descriptive Statistics: LnMW-11C_DCE, Time_25

Variable	N	N*	Mean	Median	TrMean	StDev
LnMW-11C	10	1	3.186	3.212	3.221	0.442

Variable	SE Mean	Minimum	Maximum	Q1	Q3
LnMW-11C	0.140	2.398	3.689	2.828	3.574

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.838894**	**0.0024149**
2	SPEARMAN'S RHO	-0.869305	0.0010870
3	**KENDALL'S TAU_A**	**-0.711111**	**0.0053713**
4	KENDALL'S TAU_B	-0.719147	0.0053713



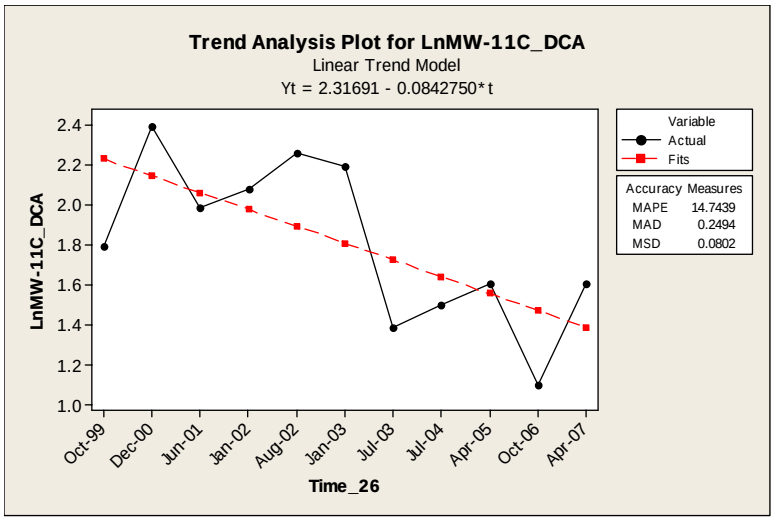
MW-11C_DCA: Downward trend

Descriptive Statistics: LnMW-11C_DCA, Time_26

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-11C	11	1.811	1.792	1.825	0.408	0.123

Variable	Minimum	Maximum	Q1	Q3
LnMW-11C	1.099	2.398	1.504	2.197

Row	CORRTYPE	CORR_VAL	P_VALUE
1	PEARSON'S R	-0.673262	0.023162
2	SPEARMAN'S RHO	-0.665150	0.025525
3	KENDALL'S TAU_A	-0.400000	0.101042
4	KENDALL'S TAU_B	-0.403687	0.101042



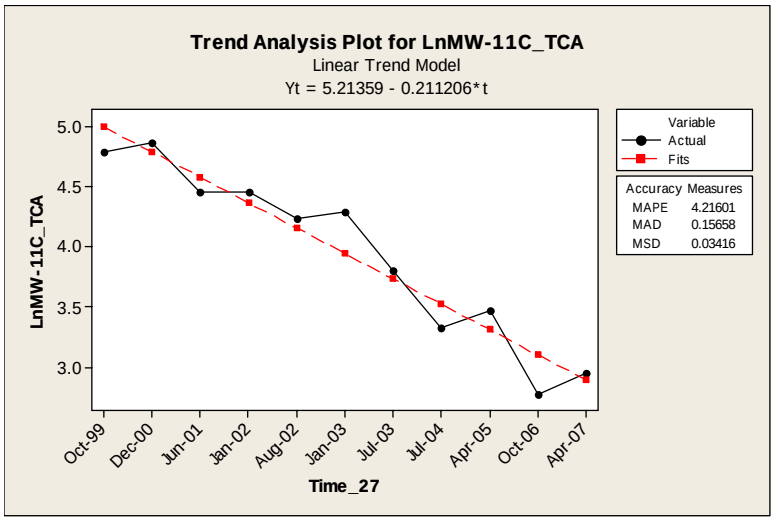
MW-11C_TCA: Downward trend

Descriptive Statistics: LnMW-11C_TCA, Time_27

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-11C	11	3.946	4.234	3.974	0.727	0.219

Variable	Minimum	Maximum	Q1	Q3
LnMW-11C	2.773	4.868	3.332	4.454

Row	CORRTYPE	CORR_VAL	P_VALUE
1	PEARSON'S R	-0.970129	0.0000008
2	SPEARMAN'S RHO	-0.961278	0.0000024
3	KENDALL'S TAU_A	-0.836364	0.0004416
4	KENDALL'S TAU_B	-0.844072	0.0004416



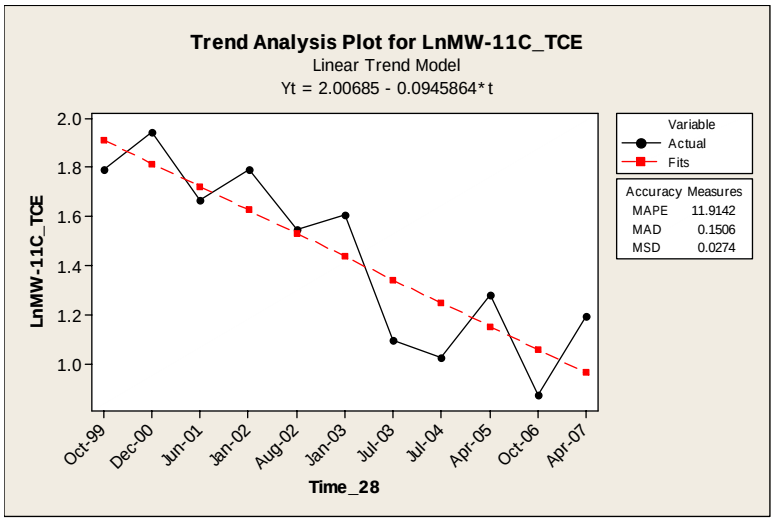
MW-11C_TCE: Downward trend

Descriptive Statistics: LnMW-11C_TCE, Time_28

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-11C	11	1.439	1.548	1.446	0.358	0.108

Variable	Minimum	Maximum	Q1	Q3
LnMW-11C	0.875	1.946	1.099	1.792

Row	CORRTYPE	CORR_VAL	P_VALUE
1	PEARSON'S R	-0.848863	0.0009503
2	SPEARMAN'S RHO	-0.861050	0.0006631
3	KENDALL'S TAU_A	-0.690909	0.0038621
4	KENDALL'S TAU_B	-0.697277	0.0038621



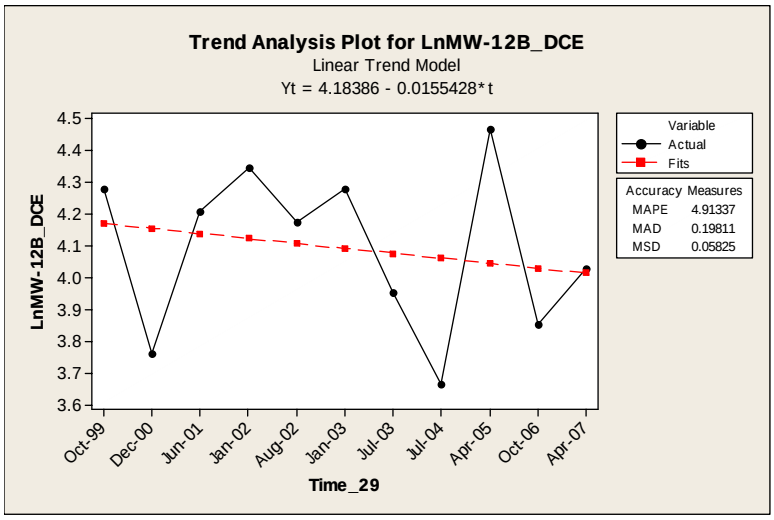
MW-12B_DCE: No statistical or clear trend

Descriptive Statistics: LnMW-12B_DCE, Time_29

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-12B	11	4.0906	4.1744	4.0963	0.2583	0.0779
Time_29	11	37751	37622	37740	871	263

Variable	Minimum	Maximum	Q1	Q3
LnMW-12B	3.6636	4.4659	3.8502	4.2767
Time_29	36434	39173	37043	38443

Row	CORRTYPE	CORR_VAL	P_VALUE
1	PEARSON'S R	-0.233135	0.490255
2	SPEARMAN'S RHO	-0.195900	0.563744
3	KENDALL'S TAU_A	-0.145455	0.584648
4	KENDALL'S TAU_B	-0.146795	0.584648



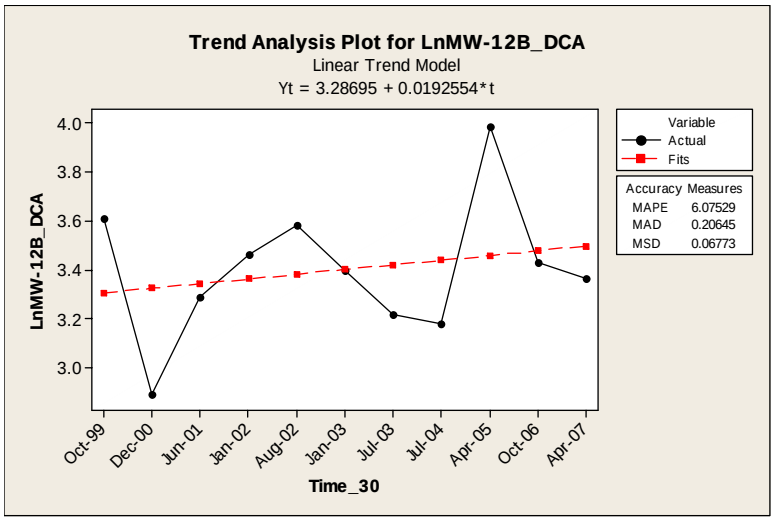
MW12B_DCA: No trend

Descriptive Statistics: LnMW-12B_DCA, Time_30

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-12B	11	3.4025	3.4012	3.3942	0.2803	0.0845

Variable	Minimum	Maximum	Q1	Q3
LnMW-12B	2.8904	3.9890	3.2189	3.5835

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**0.193118**	**0.56940**
2	SPEARMAN'S RHO	0.018182	0.95769
3	**KENDALL'S TAU_A**	**-0.018182**	**1.00000**
4	KENDALL'S TAU_B	-0.018182	1.00000



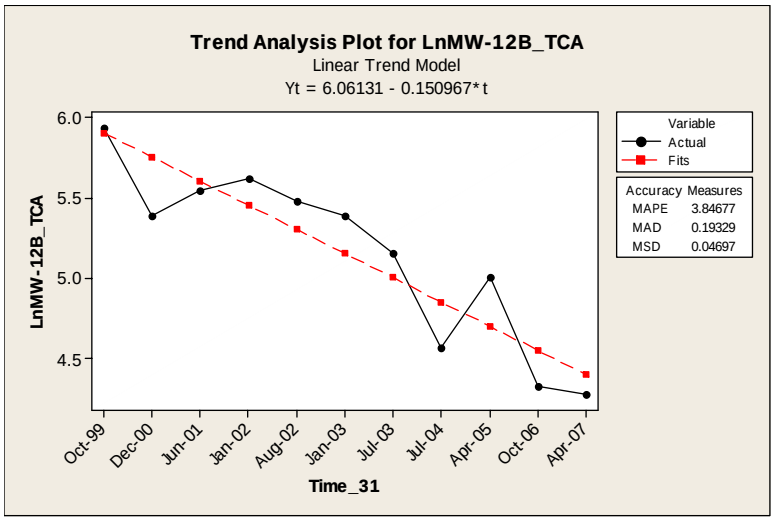
MW-12B_TCA: Downward trend

Descriptive Statistics: LnMW-12B_TCA, Time_31

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-12B	11	5.156	5.389	5.166	0.550	0.166

Variable	Minimum	Maximum	Q1	Q3
LnMW-12B	4.277	5.940	4.564	5.545

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.938097**	**0.0000196**
2	SPEARMAN'S RHO	-0.927273	0.0000397
3	**KENDALL'S TAU_A**	**-0.818182**	**0.0006139**
4	KENDALL'S TAU_B	-0.818182	0.0006139



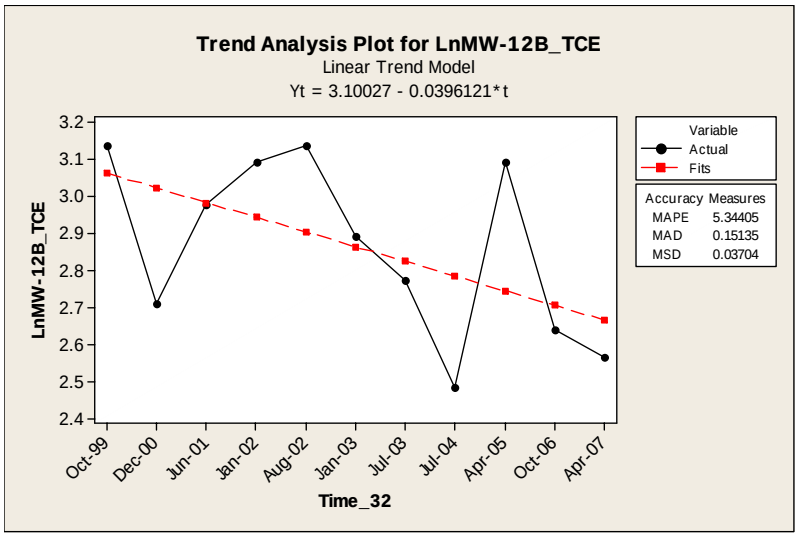
MW-12B_TCE: Downward trend at about 90% CL

Descriptive Statistics: LnMW-12B_TCE, Time_32

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-12B	11	2.8626	2.8904	2.8742	0.2408	0.0726

Variable	Minimum	Maximum	Q1	Q3
LnMW-12B	2.4849	3.1355	2.6391	3.0910

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.572195**	**0.0658518**
2	SPEARMAN'S RHO	-0.570782	0.0666760
3	**KENDALL'S TAU_A**	**-0.418182**	**0.0848572**
4	KENDALL'S TAU_B	-0.425999	0.0848572



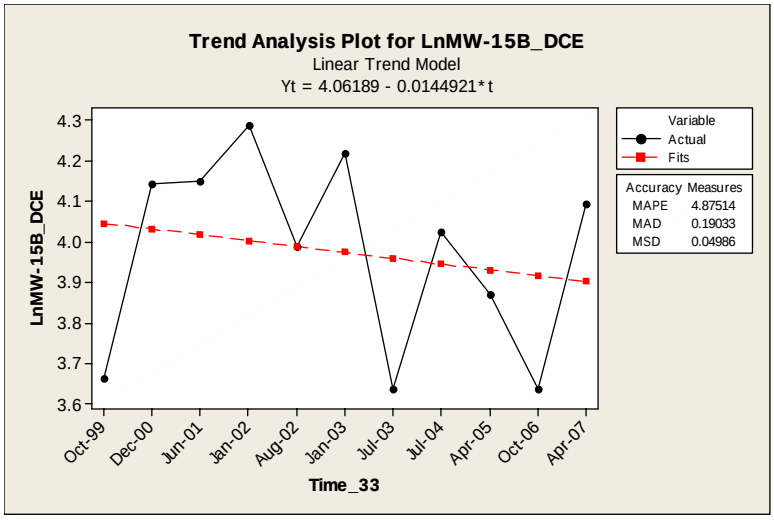
MW15-B_DCE: No statistical or clear trend

Descriptive Statistics: LnMW-15B_DCE, Time_33

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-15B	11	3.9749	4.0254	3.9774	0.2391	0.0721

Variable	Minimum	Maximum	Q1	Q3
LnMW-15B	3.6376	4.2905	3.6636	4.1526

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.179423**	**0.597581**
2	SPEARMAN'S RHO	-0.314352	0.346464
3	**KENDALL'S TAU_A**	**-0.181818**	**0.482192**
4	KENDALL'S TAU_B	-0.183494	0.482192



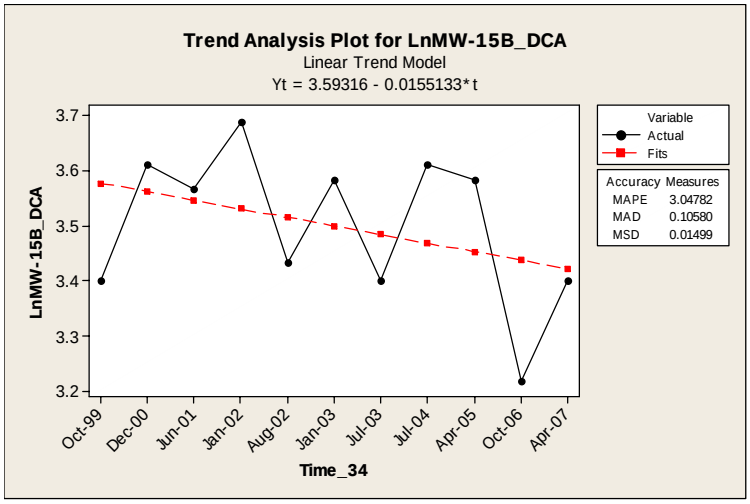
MW-15B_DCA: No statistical trend but there is an apparent downward trend.

Descriptive Statistics: LnMW-15B_DCA, Time_34

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-15B	11	3.5001	3.5667	3.5104	0.1383	0.0417

Variable	Minimum	Maximum	Q1	Q3
LnMW-15B	3.2189	3.6889	3.4012	3.6109

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.407876**	**0.213038**
2	SPEARMAN'S RHO	-0.318003	0.340585
3	**KENDALL'S TAU_A**	**-0.218182**	**0.383512**
4	KENDALL'S TAU_B	-0.228831	0.383512



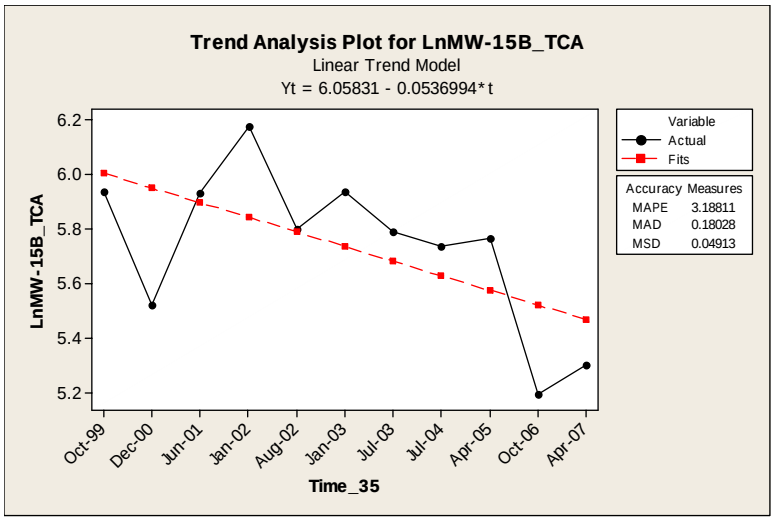
MW15B_TCA: Downward trend

Descriptive Statistics: LnMW-15B_TCA, Time_35

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-15B	11	5.7361	5.7900	5.7474	0.2929	0.0883

Variable	Minimum	Maximum	Q1	Q3
LnMW-15B	5.1930	6.1779	5.5215	5.9402

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.686062**	**0.0197561**
2	SPEARMAN'S RHO	-0.633259	0.0364754
3	**KENDALL'S TAU_A**	**-0.509091**	**0.0350011**
4	KENDALL'S TAU_B	-0.513783	0.0350011



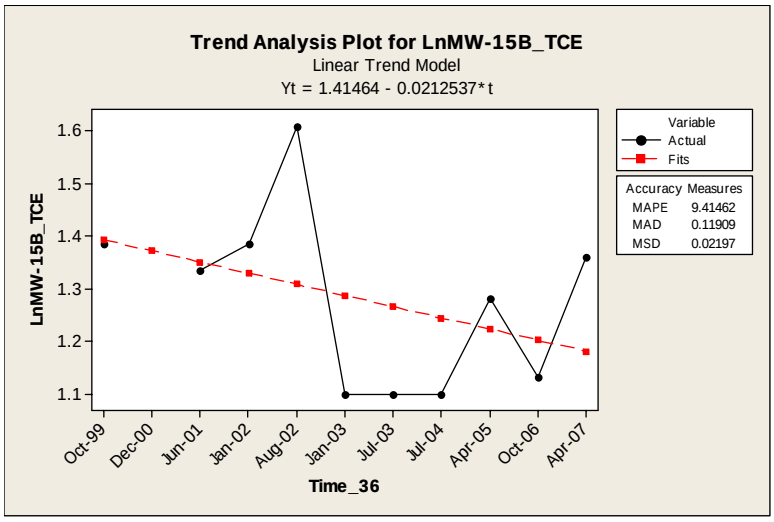
MW-15B_TCE: No statistical trend; possible apparent downward.

Descriptive Statistics: LnMW-15B_TCE, Time_36

Variable	N	N*	Mean	Median	TrMean	StDev
LnMW-15B	10	1	1.2786	1.3080	1.2598	0.1705

Variable	SE Mean	Minimum	Maximum	Q1	Q3
LnMW-15B	0.0539	1.0986	1.6094	1.0986	1.3863

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.342257**	**0.333021**
2	SPEARMAN'S RHO	-0.424666	0.221224
3	**KENDALL'S TAU_A**	**-0.200000**	**0.465828**
4	KENDALL'S TAU_B	-0.209529	0.465828



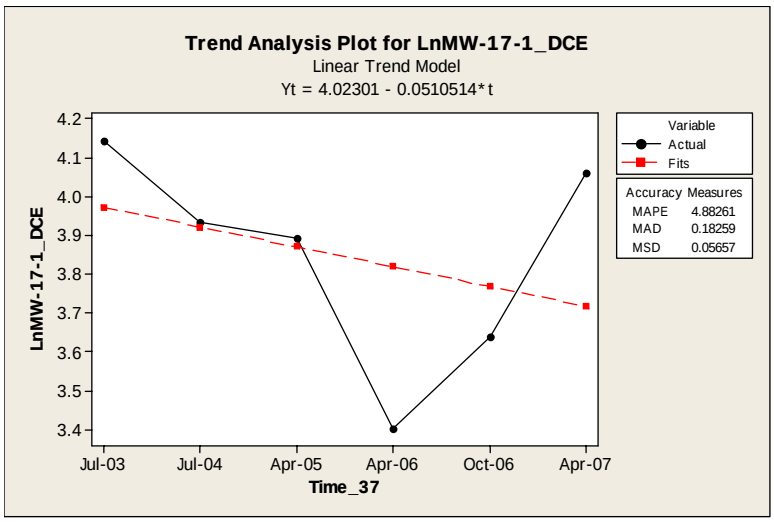
MW-17-1_DCE: No statistical or clear trend.

Descriptive Statistics: LnMW-17-1_DCE, Time_37

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-17-	6	3.844	3.912	3.844	0.277	0.113

Variable	Minimum	Maximum	Q1	Q3
LnMW-17-	3.401	4.143	3.578	4.081

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.459059**	**0.359781**
2	SPEARMAN'S RHO	-0.371429	0.468478
3	**KENDALL'S TAU_A**	**-0.333333**	**0.452370**
4	KENDALL'S TAU_B	-0.333333	0.452370



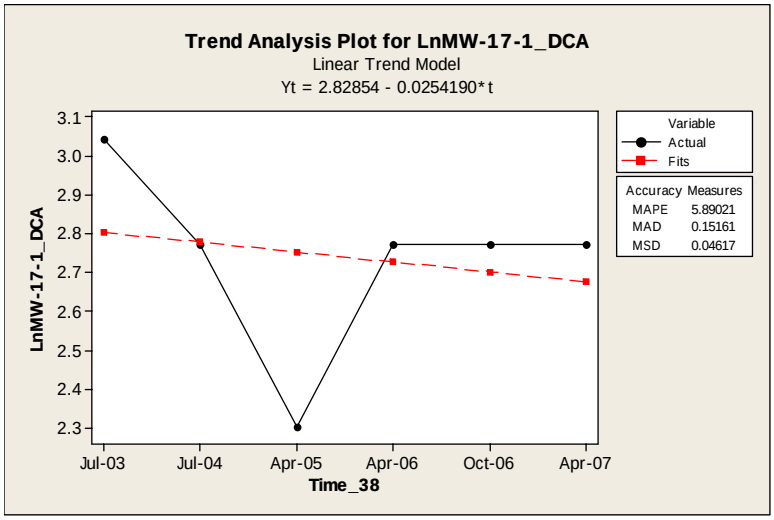
MW-17-1_DCA: No trend

Descriptive Statistics: LnMW-17-1_DCA, Time_38

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-17-	6	2.7396	2.7726	2.7396	0.2401	0.0980

Variable	Minimum	Maximum	Q1	Q3
LnMW-17-	2.3026	3.0445	2.6551	2.8406

Row	CORRTYPE	CORR_VAL	P_VALUE
1	PEARSON'S R	-0.239278	0.647933
2	SPEARMAN'S RHO	-0.338062	0.512225
3	KENDALL'S TAU_A	-0.200000	0.651998
4	KENDALL'S TAU_B	-0.258199	0.651998



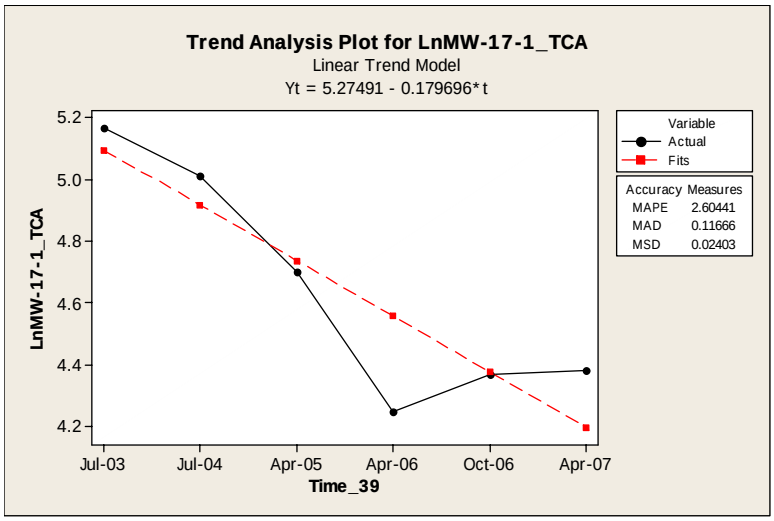
MW-17-1_TCA: Downward trend

Descriptive Statistics: LnMW-17-1_TCA, Time_39

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-17-	6	4.646	4.541	4.646	0.377	0.154

Variable	Minimum	Maximum	Q1	Q3
LnMW-17-	4.249	5.165	4.339	5.049

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.937156**	**0.005800**
2	SPEARMAN'S RHO	-0.771429	0.072397
3	**KENDALL'S TAU_A**	**-0.600000**	**0.132855**
4	KENDALL'S TAU_B	-0.600000	0.132855



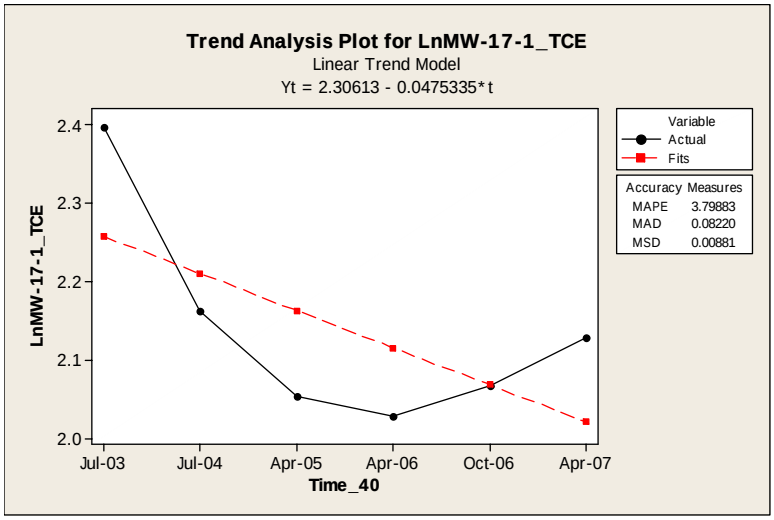
MW-17-1_TCE: Downward statistical trend (Pearson's r) at 90% CL.

Descriptive Statistics: LnMW-17-1_TCE, Time_40

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-17-	6	2.1398	2.0975	2.1398	0.1360	0.0555

Variable	Minimum	Maximum	Q1	Q3
LnMW-17-	2.0282	2.3979	2.0476	2.2220

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.734819**	**0.096157**
2	SPEARMAN'S RHO	-0.485714	0.328723
3	**KENDALL'S TAU_A**	**-0.333333**	**0.452370**
4	KENDALL'S TAU_B	-0.333333	0.452370



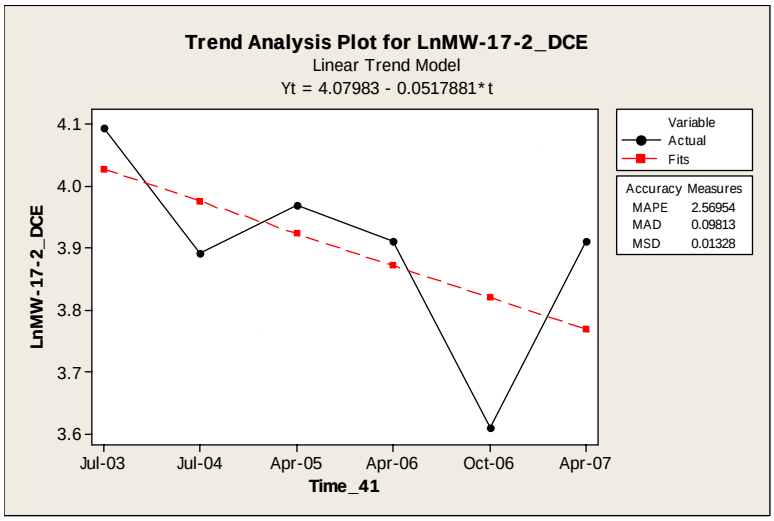
MW-17-2_DCE: No clear trend

Descriptive Statistics: LnMW-17-2_DCE, Time_41

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-17-	6	3.8986	3.9120	3.8986	0.1591	0.0650

Variable	Minimum	Maximum	Q1	Q3
LnMW-17-	3.6109	4.0943	3.8216	4.0013

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.641241**	**0.169975**
2	SPEARMAN'S RHO	-0.492805	0.320633
3	**KENDALL'S TAU_A**	**-0.400000**	**0.338888**
4	KENDALL'S TAU_B	-0.414039	0.338888



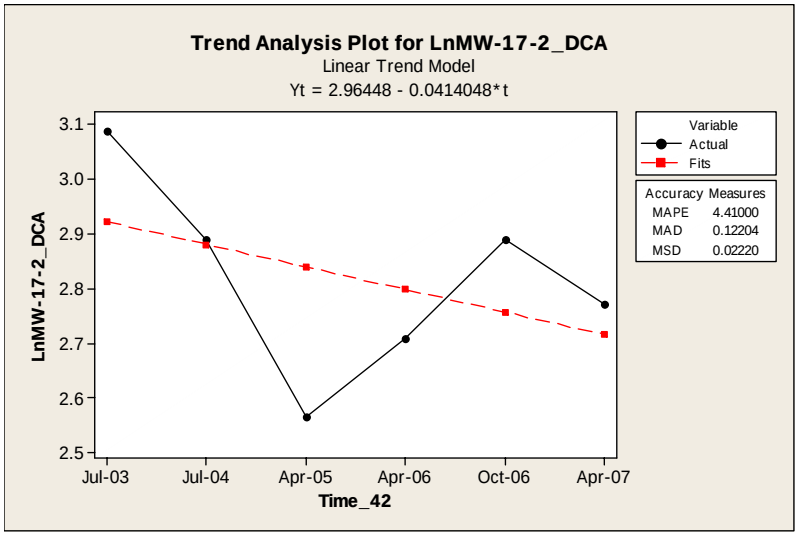
MW 17-2_DCA: No clear trend

Descriptive Statistics: LnMW-17-2_DCA, Time_42

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-17-	6	2.8196	2.8315	2.8196	0.1807	0.0738

Variable	Minimum	Maximum	Q1	Q3
LnMW-17-	2.5650	3.0910	2.6723	2.9405

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.486344**	**0.328002**
2	SPEARMAN'S RHO	-0.405840	0.424663
3	**KENDALL'S TAU_A**	**-0.266667**	**0.566090**
4	KENDALL'S TAU_B	-0.276026	0.566090



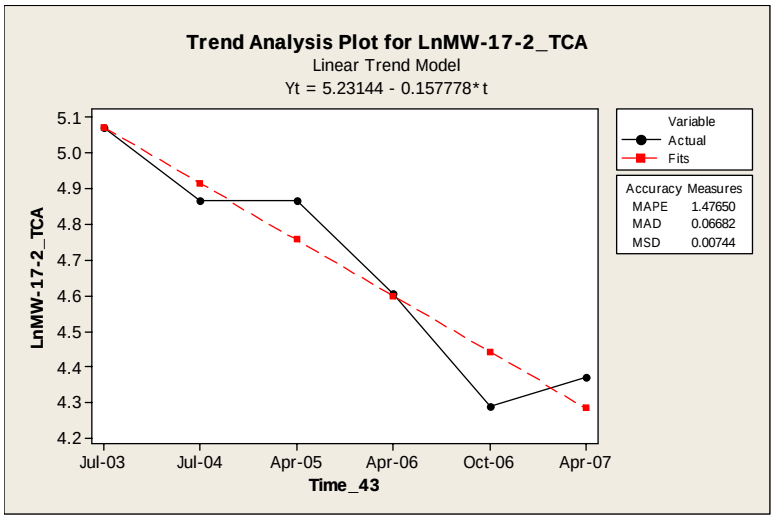
MW-17-2_TCA: Downward trend

Descriptive Statistics: LnMW-17-2_TCA, Time_43

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-17-	6	4.679	4.736	4.679	0.310	0.127

Variable	Minimum	Maximum	Q1	Q3
LnMW-17-	4.290	5.075	4.350	4.919

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.953350**	**0.0032136**
2	SPEARMAN'S RHO	-0.927634	0.0076658
3	**KENDALL'S TAU_A**	**-0.800000**	**0.0353782**
4	KENDALL'S TAU_B	-0.828079	0.0353782



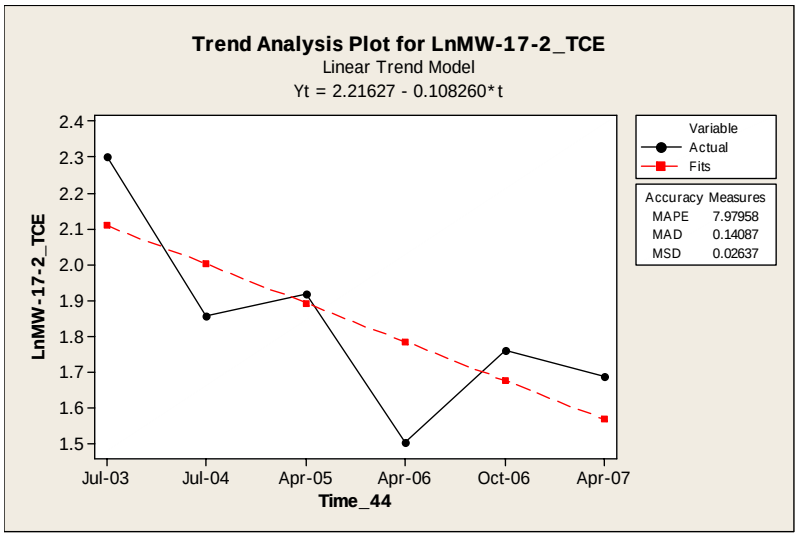
MW-17-2_TCE: Downward trend

Descriptive Statistics: LnMW-17-2_TCE, Time_44

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-17-	6	1.837	1.807	1.837	0.270	0.110

Variable	Minimum	Maximum	Q1	Q3
LnMW-17-	1.504	2.303	1.641	2.013

Row	CORRTYPE	CORR_VAL	P_VALUE
1	PEARSON'S R	-0.822010	0.044701
2	SPEARMAN'S RHO	-0.771429	0.072397
3	KENDALL'S TAU_A	-0.600000	0.132855
4	KENDALL'S TAU_B	-0.600000	0.132855



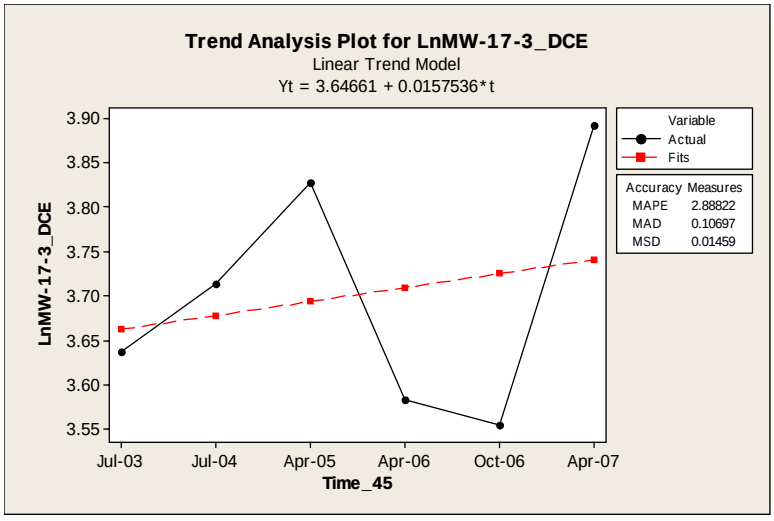
MW-17-3_DCE: No trend

Descriptive Statistics: LnMW-17-3_DCE, Time_45

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-17-	6	3.7017	3.6756	3.7017	0.1356	0.0553

Variable	Minimum	Maximum	Q1	Q3
LnMW-17-	3.5554	3.8918	3.5765	3.8444

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**0.150332**	**0.77620**
2	SPEARMAN'S RHO	0.085714	0.87174
3	**KENDALL'S TAU_A**	**0.066667**	**1.00000**
4	KENDALL'S TAU_B	0.066667	1.00000



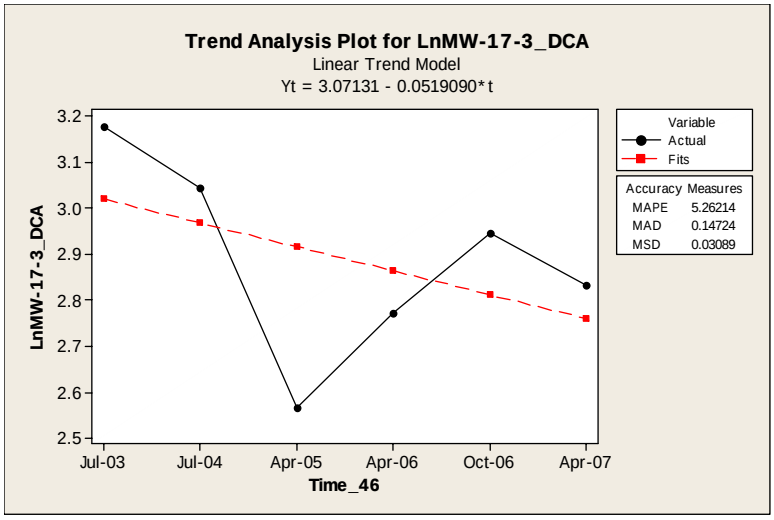
MW-17-3_DCA: No clear trend

Descriptive Statistics: LnMW-17-3_DCA, Time_46

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-17-	6	2.8896	2.8888	2.8896	0.2156	0.0880

Variable	Minimum	Maximum	Q1	Q3
LnMW-17-	2.5650	3.1781	2.7207	3.0779

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.499092**	**0.313522**
2	SPEARMAN'S RHO	-0.485714	0.328723
3	**KENDALL'S TAU_A**	**-0.333333**	**0.452370**
4	KENDALL'S TAU_B	-0.333333	0.452370



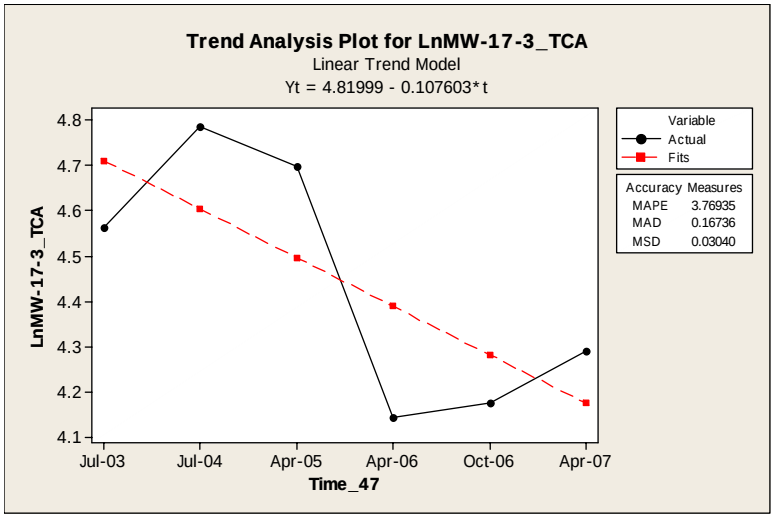
MW-17-3_TCA: Possible weak downward trend

Descriptive Statistics: LnMW-17-3_TCA, Time_47

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-17-	6	4.443	4.427	4.443	0.278	0.113

Variable	Minimum	Maximum	Q1	Q3
LnMW-17-	4.143	4.787	4.167	4.722

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.746006**	**0.088577**
2	SPEARMAN'S RHO	-0.600000	0.208000
3	**KENDALL'S TAU_A**	**-0.333333**	**0.452370**
4	KENDALL'S TAU_B	-0.333333	0.452370



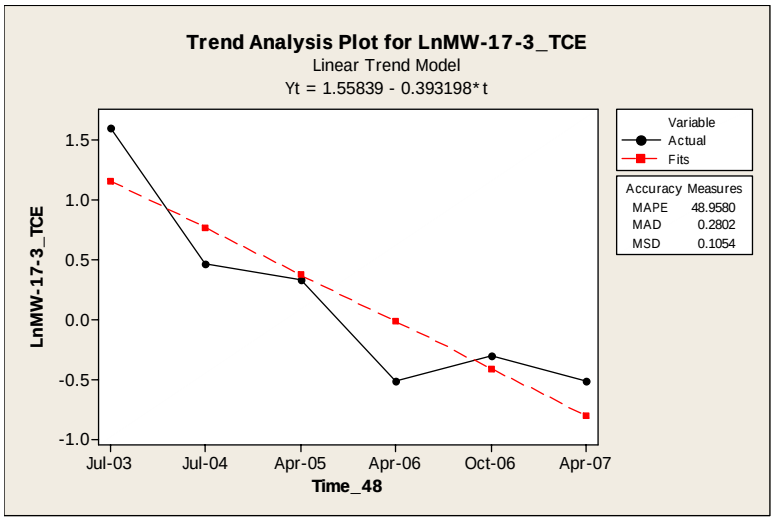
MW-17-3_TCE: Downward trend

Descriptive Statistics: LnMW-17-3_TCE, Time_48

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnMW-17-	6	0.182	0.018	0.182	0.817	0.334

Variable	Minimum	Maximum	Q1	Q3
LnMW-17-	-0.511	1.609	-0.511	0.755

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.945339**	**0.0044001**
2	SPEARMAN'S RHO	-0.898645	0.0148886
3	**KENDALL'S TAU_A**	**-0.800000**	**0.0353782**
4	KENDALL'S TAU_B	-0.828079	0.0353782



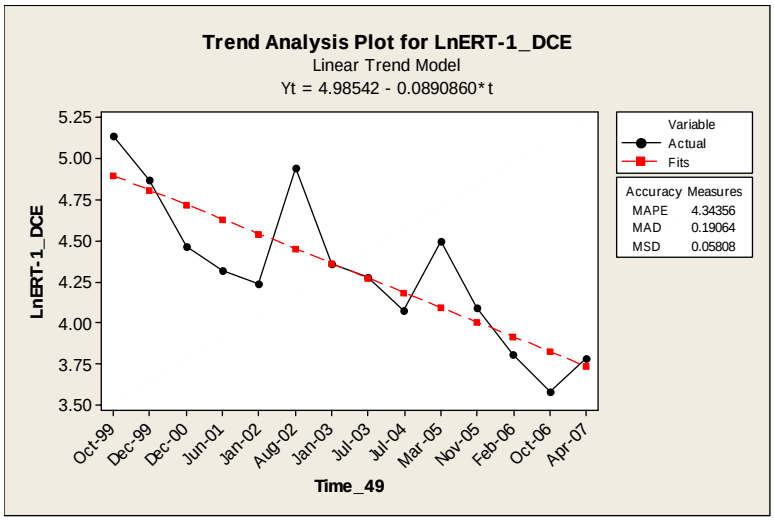
ERT-1_DCE: Downward trend

Descriptive Statistics: LnERT-1_DCE, Time_49

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-1_	14	4.317	4.297	4.310	0.449	0.120

Variable	Minimum	Maximum	Q1	Q3
LnERT-1_	3.584	5.136	4.010	4.592

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.823760**	**0.0002925**
2	SPEARMAN'S RHO	-0.802198	0.0005563
3	**KENDALL'S TAU_A**	**-0.670330**	**0.0010209**
4	KENDALL'S TAU_B	-0.670330	0.0010209



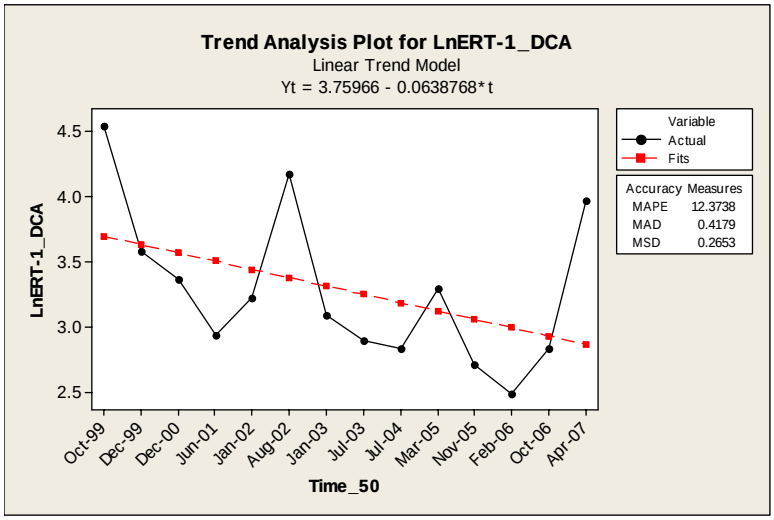
ERT-1_DCA: Statistical downward trend but times series plot suggests trend is questionable

Descriptive Statistics: LnERT-1_DCA, Time_50

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-1_	14	3.281	3.155	3.242	0.598	0.160

Variable	Minimum	Maximum	Q1	Q3
LnERT-1_	2.485	4.543	2.833	3.680

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.443542**	**0.112154**
2	SPEARMAN'S RHO	-0.534654	0.048864
3	**KENDALL'S TAU_A**	**-0.461538**	**0.024582**
4	KENDALL'S TAU_B	-0.464095	0.024582



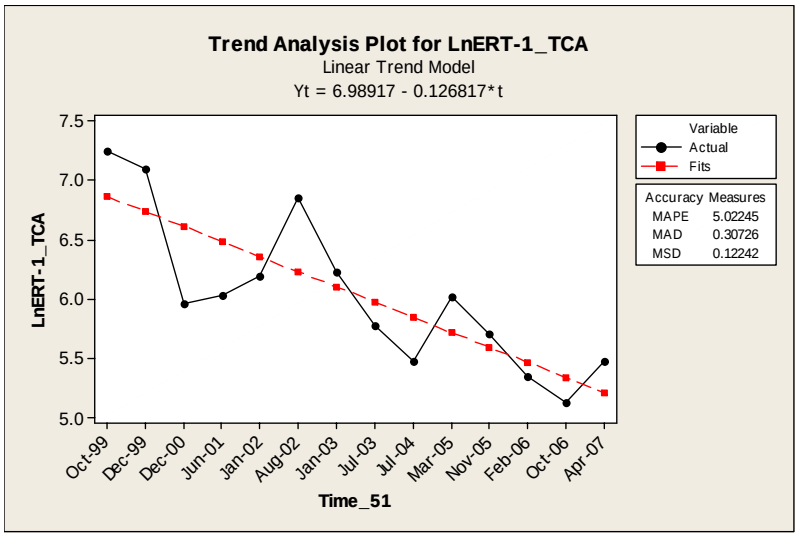
MW ERT-1_TCA: Downward trend

Descriptive Statistics: LnERT-1_TCA, Time_51

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-1_	14	6.038	5.991	6.013	0.643	0.172

Variable	Minimum	Maximum	Q1	Q3
LnERT-1_	5.136	7.244	5.481	6.381

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.827228**	**0.0002617**
2	SPEARMAN'S RHO	-0.840485	0.0001671
3	**KENDALL'S TAU_A**	**-0.659341**	**0.0012173**
4	KENDALL'S TAU_B	-0.662994	0.0012173



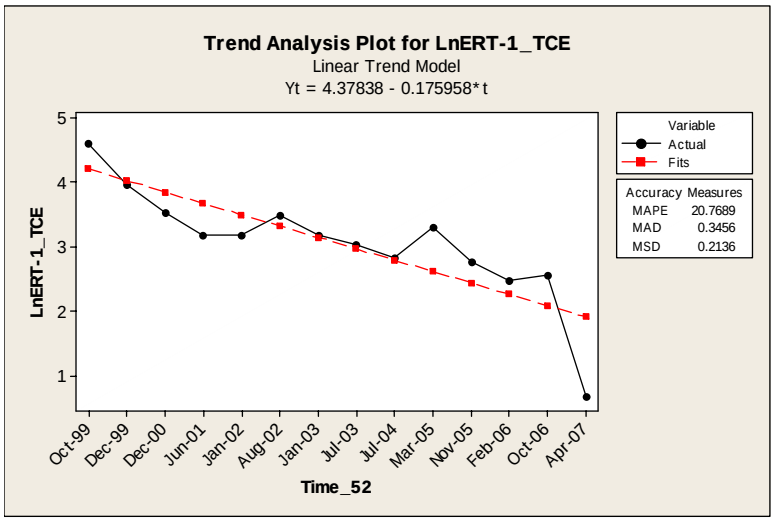
ERT-1_TCE: Downward trend

Descriptive Statistics: LnERT-1_TCE, Time_52

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-1_	14	3.059	3.178	3.127	0.879	0.235

Variable	Minimum	Maximum	Q1	Q3
LnERT-1_	0.693	4.605	2.721	3.504

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.824529**	**0.0002855**
2	SPEARMAN'S RHO	-0.898464	0.0000127
3	**KENDALL'S TAU_A**	**-0.791209**	**0.0000929**
4	KENDALL'S TAU_B	-0.804582	0.0000929



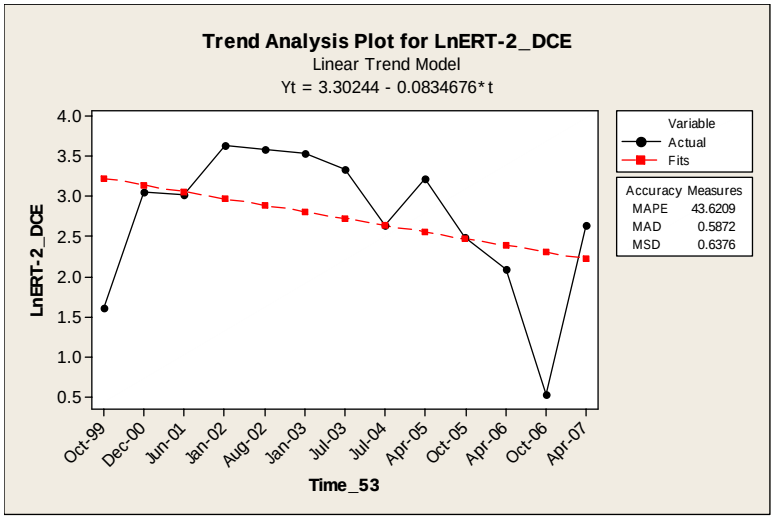
ERT-2_DCE: Statistical downward trend at 80% CL with Kendall's tau; possible weak downward trend

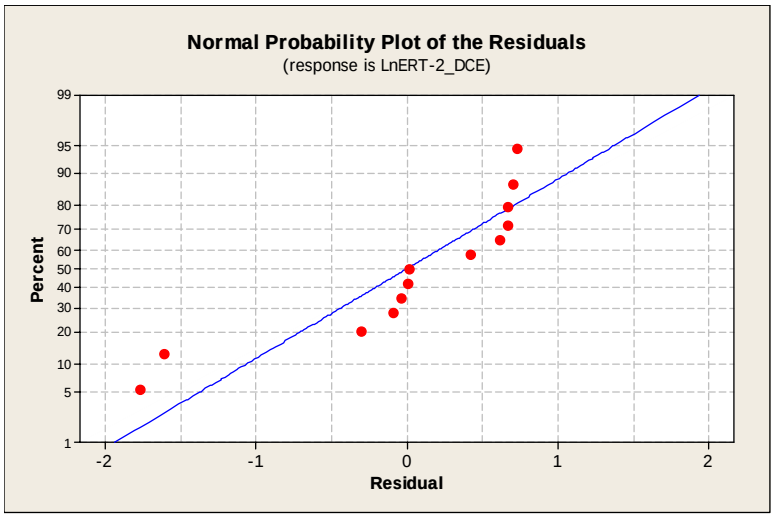
Descriptive Statistics: LnERT-2_DCE, Time_53

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-2_	13	2.718	3.011	2.833	0.892	0.248

Variable	Minimum	Maximum	Q1	Q3
LnERT-2_	0.531	3.638	2.282	3.429

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.341536**	**0.253407**
2	SPEARMAN'S RHO	-0.376892	0.204287
3	**KENDALL'S TAU_A**	**-0.346154**	**0.112017**
4	KENDALL'S TAU_B	-0.348394	0.112017





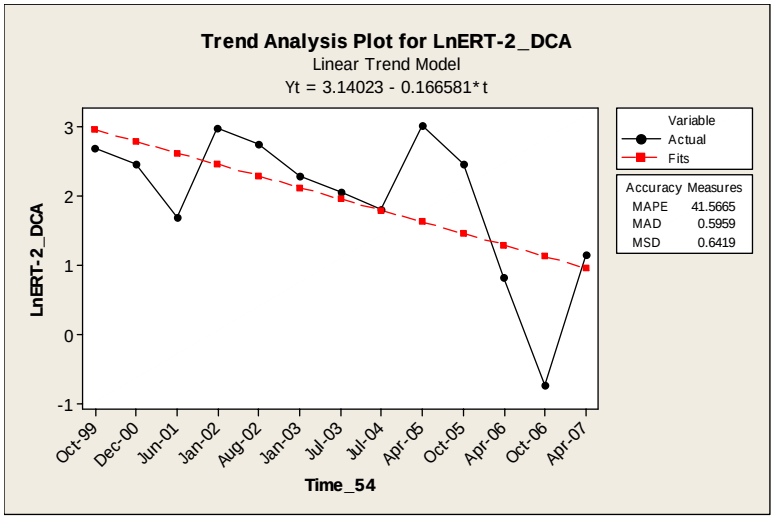
ERT-2_DCA: Downward trend

Descriptive Statistics: LnERT-2_DCA, Time_54

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-2_	13	1.974	2.303	2.123	1.057	0.293

Variable	Minimum	Maximum	Q1	Q3
LnERT-2_	-0.734	3.045	1.434	2.740

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.594293**	**0.0322005**
2	SPEARMAN'S RHO	-0.528199	0.0635229
3	**KENDALL'S TAU_A**	**-0.397436**	**0.0667012**
4	KENDALL'S TAU_B	-0.400008	0.0667012



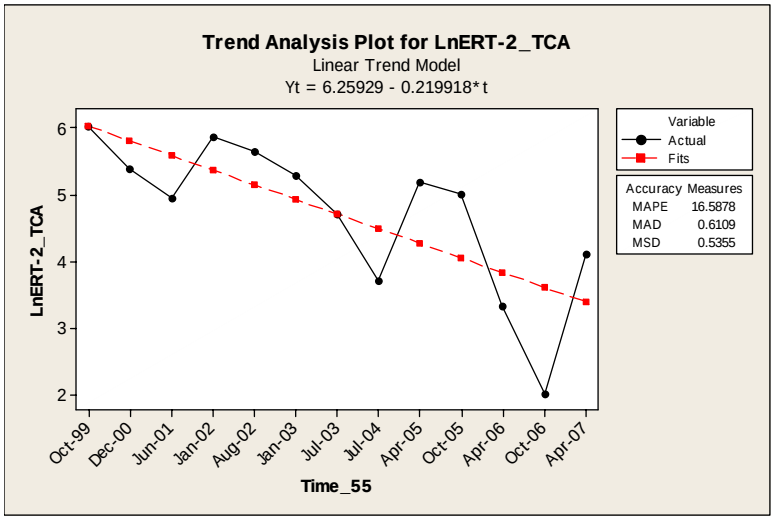
ERT-2_TCE: Downward trend

Descriptive Statistics: LnERT-2_TCA, Time_55

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-2_	13	4.720	5.011	4.846	1.146	0.318
Time						

Variable	Minimum	Maximum	Q1	Q3
LnERT-2_	2.015	6.040	3.920	5.532

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.742021**	**0.0036827**
2	SPEARMAN'S RHO	-0.780220	0.0016525
3	**KENDALL'S TAU_A**	**-0.641026**	**0.0027949**
4	KENDALL'S TAU_B	-0.641026	0.0027949



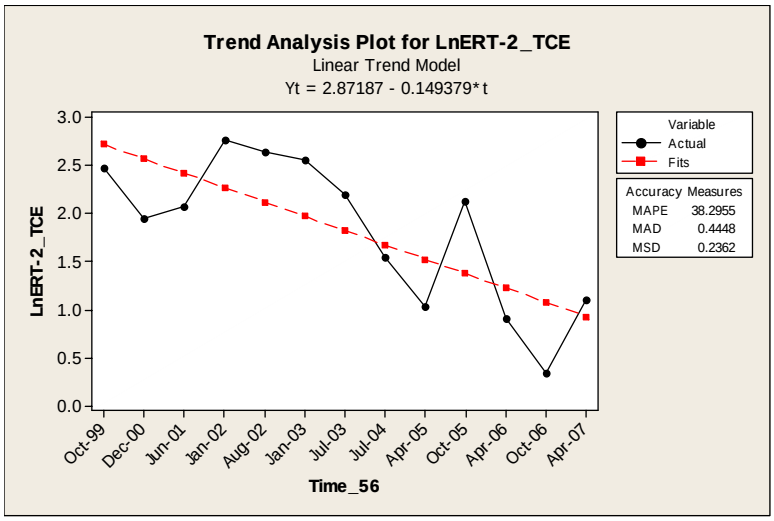
ERT-2_TCE: Downward trend

Descriptive Statistics: LnERT-2_TCE, Time_56

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-2_	13	1.826	2.079	1.876	0.771	0.214

Variable	Minimum	Maximum	Q1	Q3
LnERT-2_	0.336	2.773	1.064	2.525

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.762982**	**0.0024148**
2	SPEARMAN'S RHO	-0.659341	0.0142256
3	**KENDALL'S TAU_A**	**-0.512821**	**0.0173434**
4	KENDALL'S TAU_B	-0.512821	0.0173434



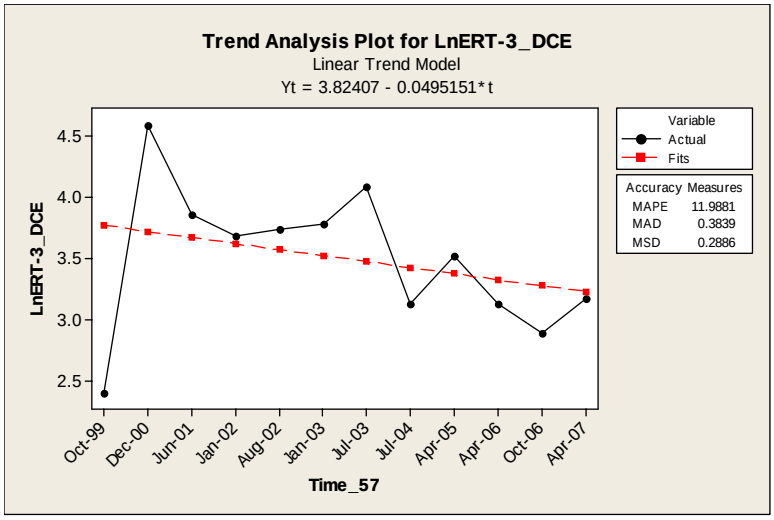
ERT-3_DCE: Statistical downward trend for Kendall's tau at 80% CL overall; there seems to be a significant decreasing trend after December 2000.

Descriptive Statistics: LnERT-3_DCE, Time_57

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-3_	12	3.502	3.608	3.503	0.589	0.170

Variable	Minimum	Maximum	Q1	Q3
LnERT-3_	2.398	4.595	3.135	3.843

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.293529**	**0.354452**
2	SPEARMAN'S RHO	-0.378284	0.225327
3	**KENDALL'S TAU_A**	**-0.318182**	**0.169229**
4	KENDALL'S TAU_B	-0.320620	0.169229



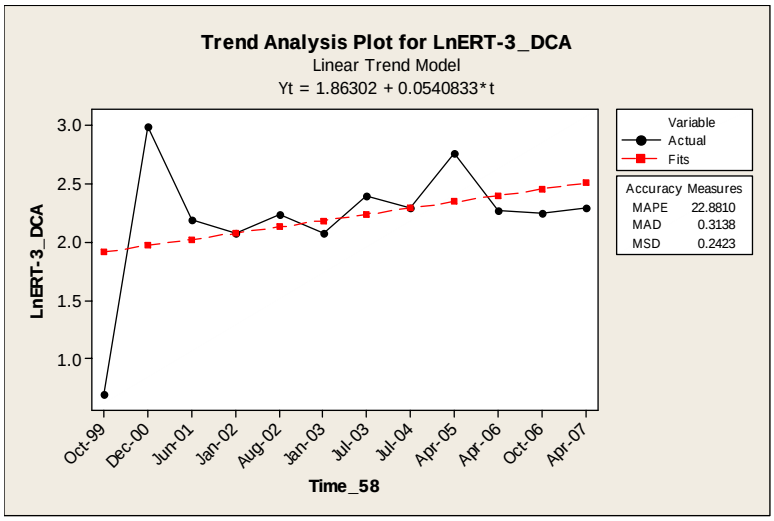
ERT-3_DCA: There is an increasing statistical trend at about the 80% CL.

Descriptive Statistics: LnERT-3_DCA, Time_58

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-3_	12	2.215	2.262	2.289	0.550	0.159

Variable	Minimum	Maximum	Q1	Q3
LnERT-3_	0.693	2.996	2.109	2.374

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**0.384525**	**0.217138**
2	SPEARMAN'S RHO	0.399300	0.198476
3	**KENDALL'S TAU_A**	**0.287879**	**0.216006**
4	KENDALL'S TAU_B	0.290085	0.216006



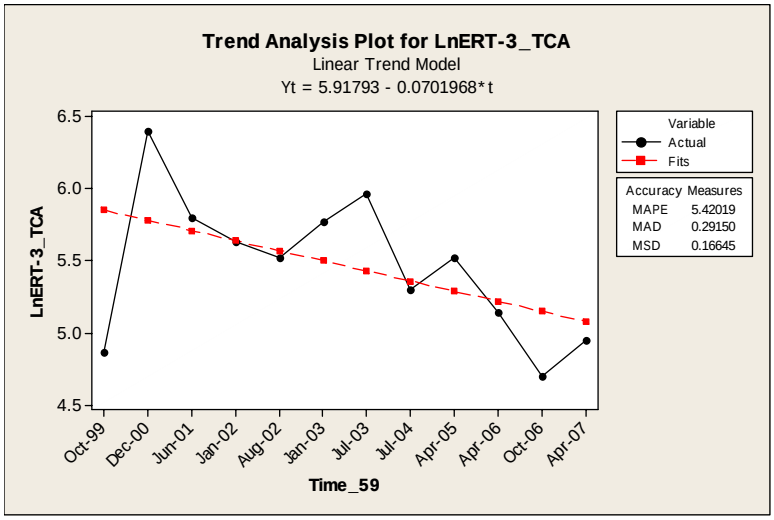
ERT-3_TCA: Decreasing statistical trend at about 90% CL

Descriptive Statistics: LnERT-3_TCA, Time_59

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-3_	12	5.462	5.521	5.444	0.496	0.143

Variable	Minimum	Maximum	Q1	Q3
LnERT-3_	4.700	6.397	4.990	5.787

Row	CORRTYPE	CORR_VAL	P_VALUE
1	PEARSON'S R	-0.508693	0.091242
2	SPEARMAN'S RHO	-0.490369	0.105548
3	KENDALL'S TAU_A	-0.439394	0.054284
4	KENDALL'S TAU_B	-0.442761	0.054284



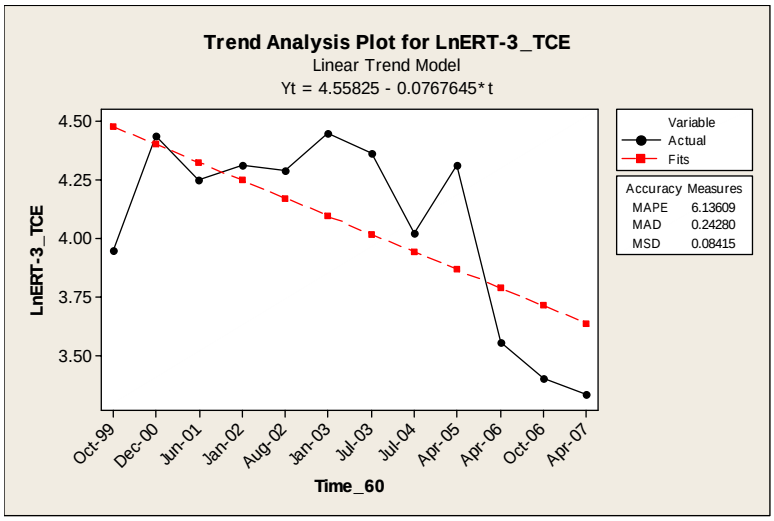
ERT-3_TCE: Downward trend

Descriptive Statistics: LnERT-3_TCE, Time_60

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-3_	12	4.059	4.272	4.092	0.410	0.118

Variable	Minimum	Maximum	Q1	Q3
LnERT-3_	3.332	4.454	3.654	4.356

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.696832**	**0.0117940**
2	SPEARMAN'S RHO	-0.500876	0.0971738
3	**KENDALL'S TAU_A**	**-0.378788**	**0.0990198**
4	KENDALL'S TAU_B	-0.381691	0.0990198



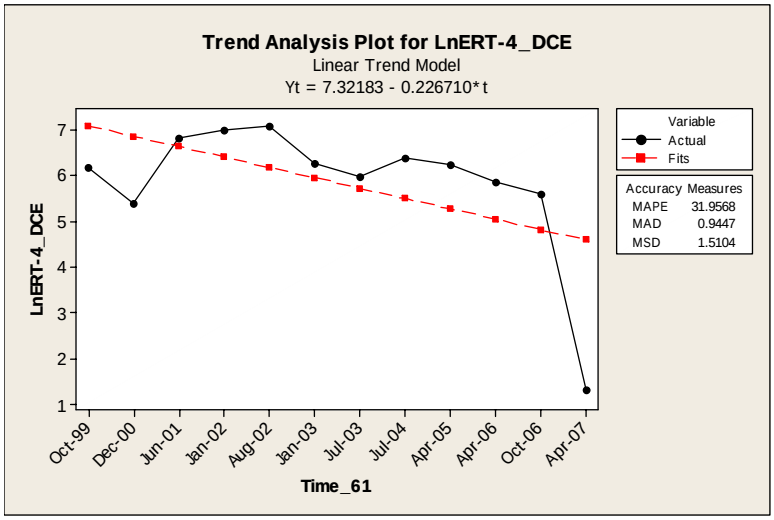
ERT-4_DCE: Downward statistical trend at 80% - 90% CL with Kendall's tau

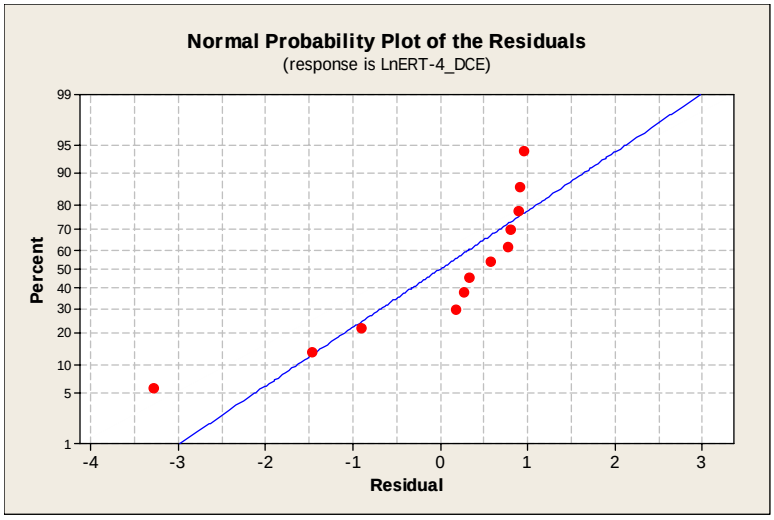
Descriptive Statistics: LnERT-4_DCE, Time_61

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-4_	12	5.848	6.214	6.178	1.522	0.439

Variable	Minimum	Maximum	Q1	Q3
LnERT-4_	1.308	7.090	5.663	6.718

Row	CORRTYPE	CORR_VAL	P_VALUE
1	PEARSON'S R	-0.537994	0.071187
2	SPEARMAN'S RHO	-0.419580	0.174519
3	**KENDALL'S TAU_A**	**-0.363636**	**0.114757**
4	KENDALL'S TAU_B	-0.363636	0.114757





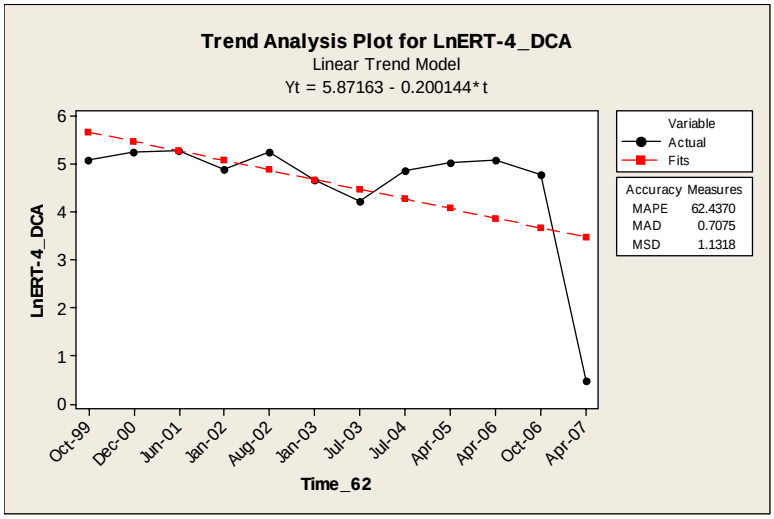
ERT-4: Downward statistical trend at about 90% CL

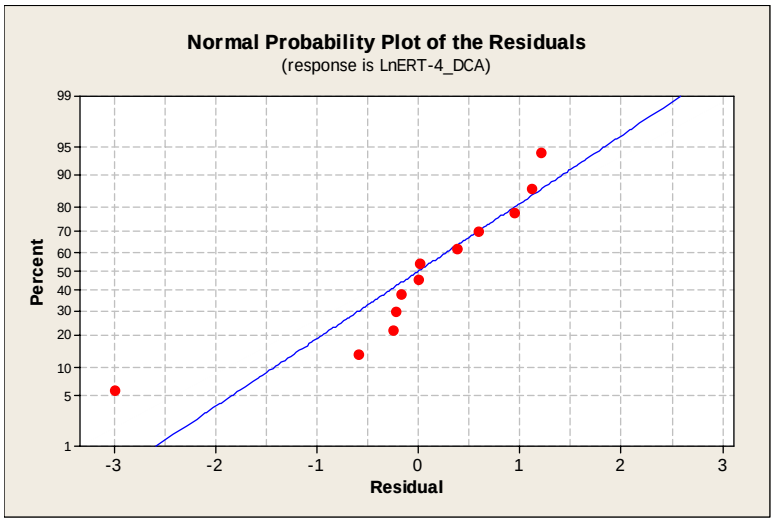
Descriptive Statistics: LnERT-4_DCA, Time_62

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-4_	12	4.571	4.954	4.910	1.325	0.382

Variable	Minimum	Maximum	Q1	Q3
LnERT-4_	0.470	5.278	4.701	5.204

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.523699**	**0.0805484**
2	SPEARMAN'S RHO	-0.624565	0.0299242
3	**KENDALL'S TAU_A**	**-0.424242**	**0.0628535**
4	KENDALL'S TAU_B	-0.430820	0.0628535





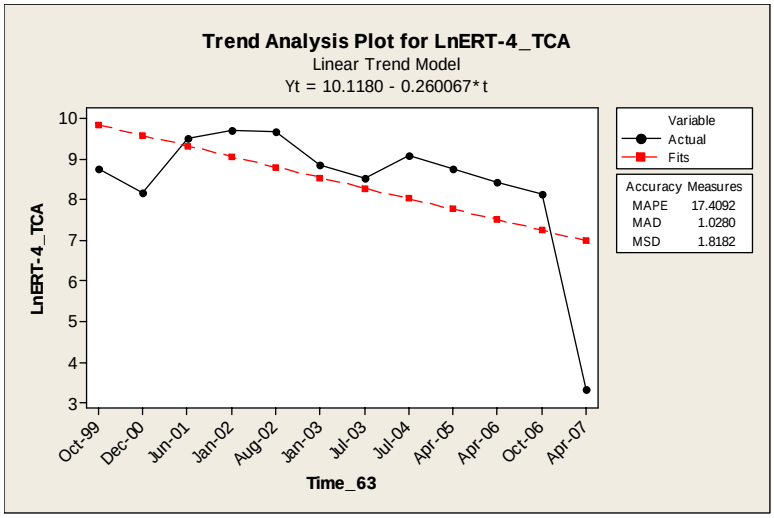
ERT-4_TCA: Downward statistical trend at about 90% CL

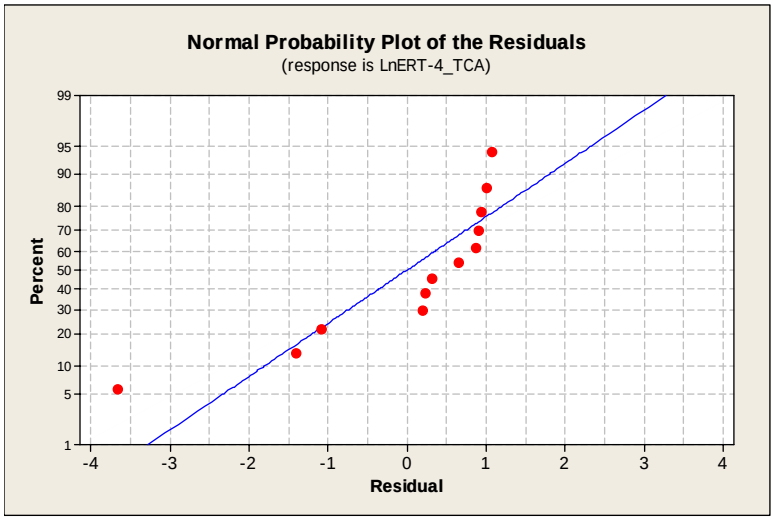
Descriptive Statistics: LnERT-4_TCA, Time_63

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-4_	12	8.428	8.772	8.806	1.692	0.488

Variable	Minimum	Maximum	Q1	Q3
LnERT-4_	3.332	9.735	8.255	9.426

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.551740**	**0.062918**
2	SPEARMAN'S RHO	-0.489510	0.106252
3	**KENDALL'S TAU_A**	**-0.424242**	**0.064104**
4	KENDALL'S TAU_B	-0.424242	0.064104





ERT-4_TCE: Downward trend

Descriptive Statistics: LnERT-4_TCE, Time_64

Variable	N	Mean	Median	TrMean	StDev	SE Mean
LnERT-4_	12	5.670	5.938	5.901	1.199	0.346

Variable	Minimum	Maximum	Q1	Q3
LnERT-4_	2.219	6.811	5.389	6.379

Row	CORRTYPE	CORR_VAL	P_VALUE
1	**PEARSON'S R**	**-0.689374**	**0.0131321**
2	SPEARMAN'S RHO	-0.804196	0.0016148
3	**KENDALL'S TAU_A**	**-0.636364**	**0.0049315**
4	KENDALL'S TAU_B	-0.636364	0.0049315