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MATRIXNEWORLD
Enabling Progress

October 13, 2014

Ms. Catherine Brown
EPA - Region IX
75 Hawthorne Street
SFD-6-2
DELIVER TO 9TH FLOOR
San Francisco, CA 94105

Re: REVISED FINAL TECHNICAL MEMORANDUM: EVALUATION OF WIDESPREAD PERCHLORATE IN GROUNDWATER AT THE PHOENIX-GOODYEAR AIRPORT-NORTH SUPERFUND SITE GOODYEAR, ARIZONA

Dear Ms. Brown:

On behalf of Crane Co., Matrix New World Engineering, Inc. (Matrix) is pleased to present this Final Technical Memorandum on the evaluation of widespread perchlorate in groundwater in the area containing the Phoenix-Goodyear Airport-North (PGA-North) and Phoenix-Goodyear Airport-South (PGA-South) Superfund Sites, the Western Avenue Water Quality Assurance Revolving Fund (WA WQARF) Site located within the cities of Goodyear and Avondale, Arizona, as well as other potential sources of perchlorate in the West Salt River Valley. Figure 1 depicts the study area of PGA-North, PGA-South, WA WQARF, and north to Lake Pleasant. This evaluation was requested by the United States Environmental Protection Agency (EPA) at the February 6, 2013 Technical Regulatory Meeting for PGA-North.

INTRODUCTION AND PURPOSE

The purpose of this Technical Memorandum is to evaluate the February 2013 dissolved perchlorate distribution at the PGA-North Site in Subunit A and Subunit C groundwater. This distribution shows that perchlorate concentrations in some of the Subunit A monitor wells located south of Interstate-10 (I-10) are above the Health Based Guidance Level (HBGL) of 14 micrograms per Liter (µg/L), with the majority of the perchlorate mass occurring with the higher trichloroethene (TCE) mass in onsite monitor wells. Similarly, in Subunit C, perchlorate concentrations in some of the monitor wells located south of I-10 are above the HBGL, with the majority of mass also located with the higher TCE mass in onsite wells. Perchlorate in both aquifer units in this specific area is related to the past waste disposal practices that occurred at the Former Unidynamics Phoenix Incorporated (UPI) facility from the 1960s to 1980s.

North of I-10, perchlorate concentrations in Subunit A and Subunit C are much lower and are similar to perchlorate concentrations found along the Central Arizona Project (CAP) Canal recharge facilities, water supply wells outside the PGA-North plume boundaries, and at PGA-South where perchlorate is not a compound of concern (COC). As such, it has been postulated that the low levels of perchlorate outside the footprint of the TCE plumes, in both aquifer units, are not related to PGA-North, but rather from other anthropogenic and potentially natural sources. The February 2013 TCE and perchlorate plumes in groundwater within Subunits A and C are graphically depicted in Figures 2 and 3, respectively.

PERCHLORATE BACKGROUND

Perchlorate is an anion consisting of a chlorine atom bonded to four oxygen atoms (ClO_4^-). It is typically found in the form of perchloric acid and salts such as ammonium perchlorate, potassium perchlorate, and sodium perchlorate. Perchlorate is usually found as the anion component of a salt most often associated with one of the following common cations: ammonium (NH_4+), sodium (Na+), or potassium (K+). The resulting salts are ammonium perchlorate (NH_4ClO_4), sodium perchlorate ($NaClO_4$), and potassium perchlorate ($KClO_4$) (ITRC 2005). Perchlorate can be a manmade manufactured chemical or can also occur naturally in soil and groundwater (EPA 2002).

Typically, sites that have been identified with high concentrations of perchlorate contamination in groundwater show plumes that are long and persistent with concentrations that are in the 1,000 to 100,000 µg/L range or more. In general, these sites involved manufacturing, testing, or disposal of solid rocket propellant, manufacturing of perchlorate compounds, and industrial manufacturing operations where large amounts of perchlorate compounds were used as reagents. For comparison, since only a small amount of perchlorate was reportedly used in manufacturing and testing at the former UPI facility, the highest recorded concentration in a PGA-North onsite monitor well was 94 µg/L in 2010, and in 2003, the Phase II investigation identified perchlorate at a concentration of 200 µg/L in a depth specific sample collected at 120 feet below ground surface (CH2M Hill 2004).

PERCHLORATE ANALYSIS

In the spring of 1997, an analytical method (EPA 314.0) was developed for perchlorate with a reporting limit of 4 µg/L using ion chromatography. Since then, additional sampling and analysis methods like EPA Method 314.1 and EPA method 332.0 have been developed that can detect perchlorate at concentrations of 1 µg/L and lower. This lowered detection limit was important to identifying and understanding the distribution of perchlorate from the former UPI facility. It is important to note that perchlorate sampling and analytical techniques require special considerations due to matrix interferences such as groundwater with high specific conductance or high total dissolved solids (TDS). For example, at PGA-North where groundwater has been demonstrated to have high TDS, Accutest Laboratories noted that there are basic limitations to ion chromatography (IC) that require dilution due to TDS. The TDS overloads the analytical column and can cause high pressure and inaccurate data. We are required to dilute as any other lab would dilute due to TDS. We are confident in the results and there may be minute changes due to manual integration, but not gross. These differences would be multiplied by the dilution applied. This can be problematic when trying to detect low levels of perchlorate.

PERCHLORATE SOURCES AND POTENTIAL IMPACTS TO GROUNDWATER

According to the Strategic Environmental Research Development Program (SERDP), it is estimated that perchlorate is present in groundwater in at least 30 states and affects the drinking water supplies of more than 20 million people in the southwestern United States (U.S.). The source of perchlorate in water supplies has typically been attributed to U.S. Department of Defense (DOD), National Aeronautics & Space Administration (NASA), and/or defense contractor facilities, like the former UPI facility, that have used perchlorate in varying quantities. Additionally, perchlorate impacts to groundwater and surface waters in southern Arizona, Nevada, and southern California have also been attributed to the historic production and release of perchlorate from a former chemical manufacturing facility near Henderson, Nevada (Hogue 2003), which has impacted the surface waters of Lake Mead, the Colorado River (SERDP 2005), and subsequently the CAP Canal and distribution systems. It has also been documented that naturally occurring perchlorate from atmospheric deposition can be present in arid and semi-arid environments like the Atacama Desert in Chile and the deserts of the southwestern U.S.

Natural Sources

While perchlorate was once thought to occur naturally only in one location in the Atacama Desert in Chile, ongoing studies have found naturally occurring perchlorate in other locations as well. The U.S. Geological Survey (USGS) and their colleagues recently conducted a study on the widespread accumulations of natural perchlorate in soils in the southwestern U.S. The results of the study found perchlorate accumulations in soil at all sample sites in Texas, Nevada, New Mexico, and California at concentrations that range from 84 milligram per kilogram (mg/kg) to 630 mg/kg (Rao, Anderson, et al. 2007). For comparison, perchlorate concentrations in soil at PGA-North have ranged from below laboratory reporting limits to 53 mg/kg as identified during the Source Area Soils and Facility Structures (SASFS) Investigation (AMEC 2011).

A current theory regarding the origin of naturally occurring perchlorate in the environment centers on natural atmospheric processes. While the exact mechanism for the creation and rate of accumulation of perchlorate is unknown, the theory suggests that chloride, possibly in the form of sodium chloride from the sea or land-based chloride compounds blown in from the atmosphere, reacts with atmospheric ozone to create perchlorate. This process probably occurs over much of the earth and is analogous to nitrate formation in the atmosphere (Walvoord et al. 2003).

To evaluate if atmospheric perchlorate could be formed, rain and snow samples were collected from sites in Lubbock, Texas; Hingham, Massachusetts; and Coco Beach, Florida to evaluate for perchlorate. The results of this study suggest that 70% of the samples collected contained detectable perchlorate that ranged in concentration from 0.08 µg/L to 1.6 µg/L, with the highest perchlorate sample result occurring in the Lubbock, Texas area and also corresponded with the highest nitrate sample results (Dasgupta, Jackson, et al. 2005). The results of this study suggest that atmospheric perchlorate can be generated, fall as local precipitation, and can accumulate in surface and near surface soils, especially in arid and semi-arid environments (Andraski, et. al, 2014).

Isotopic evidence indicates that Chilean perchlorate and nitrate (Ericksen 1983) and the southwest desert perchlorate are of atmospheric origin. Perchlorate in the Atacama Desert, has possibly accumulated over 6 to 10 million years due to the hyper-arid conditions of the region and, it has been recently hypothesized, that similar accumulations of perchlorate in the southwestern U.S. are occurring but have only persisted for an estimated 10 to 16 thousand years (leading to the accumulation of meteoric perchlorate salts at much lower magnitudes than those in Chile) (Rao, Andersen, et al. 2007).

Anthropogenic Sources

Chilean Nitrate Fertilizers

According to a 2005 study conducted by SERDP, between 1909 and 1929 (the period for which detailed information could be obtained), the U.S. imported an estimated 19 million tons of Chilean nitrate from the Atacama Desert of Chile (Goldenwieser 1919; Howard 1931), of which an average of 65% was used as fertilizer (Brand 1930). Assuming an average perchlorate content of about 0.2% in Chilean nitrate (based on EPA research results) approximately 49 million pounds of perchlorate may have been unknowingly applied to agricultural soils during this time period, for fertilization of crops such as cotton, tobacco, fruits, and vegetables in many states (SERDP 2005) including Arizona (a well-known cotton producing state). A large part of the land in the vicinity of the PGA-North Site was formerly known as Goodyear Farms, where many acres of cotton were grown for the tire industry.

While the use of Chilean nitrate fertilizers has steadily declined since about the 1930s, there is evidence of continued use through present day. Although there is no historical record of how much Chilean nitrate has been used as fertilizer in Arizona and other specific geographical regions, based on the heavy agricultural activities that occurred from the early 1900s to the present in the West Salt River

Valley, including Goodyear and Avondale, it seems likely that nitrate fertilizers derived from Chile may have been used.

According to SERDP, it is difficult to predict the fate and persistence of the applied perchlorate. The behavior of perchlorate in agricultural settings has not been investigated in detail, and several crucial aspects of perchlorate behavior in such settings (e.g., plant uptake, biodegradation, mobility in relation to soil factors, etc.) are not well documented. However, nitrate (the principal component of the Chilean nitrate fertilizer) and perchlorate, share similar chemical features and can leach to groundwater. Many aspects of the large body of literature concerning nitrate contamination of groundwater due to fertilizer use can be applied directly to understanding the potential for perchlorate distribution and contamination of groundwater through the same flushing mechanism described above that transports perchlorate from the vadose zone to the saturated zone. It must be noted that the high nitrate levels in groundwater in the West Salt River valley, including Goodyear and Avondale, have been attributed to the heavy agricultural use of the area and the leaching of nitrate fertilizers.

Central Arizona Project Canal - Former Chemical Manufacturing Facility near Henderson Nevada
Local perchlorate contamination in the West Salt River Valley has been associated with a release at the Kerr-McGee facility in Henderson Nevada where considerable amounts of process effluent was discharged to unlined evaporation ponds over the years. As a result of the percolation of perchlorate, the groundwater in the vicinity of the manufacturing facility has been contaminated and has seeped into the Las Vegas Wash which drains into Lake Mead, and ultimately into the Colorado River. Detectable concentrations of perchlorate have been found from Lake Mead to Yuma, Arizona and along the CAP Canal recharge areas and distribution systems. The CAP Canal began flowing in the area north of the PGA-North site in 1993 and the City of Avondale began receiving CAP water for recharge in 1998.

ENVIRONMENTAL FATE AND TRANSPORT

As described above, perchlorate may be released into the environment in the form of a number of different salts from anthropogenic or naturally occurring sources. All are highly soluble in water, though the solubility of the various salts varies. Perchlorate does not appreciably bind to soil particles and the movement of perchlorate in soil is largely a function of the amount of water present. Perchlorate salts in the soil in solid form will readily dissolve in whatever moisture is available. If sufficient infiltration occurs, the perchlorate will be completely leached from the soil. Soil moisture containing perchlorate in solution can be taken up by plants through the roots, and several ecological studies have demonstrated the tendency of some plants to concentrate the perchlorate in plant tissues (Urbansky et al. 2000; Ellington et al. 2001). Some perchlorate may be held in solution in the vadose zone by capillary forces. In arid regions, crystallized perchlorate salts may accumulate at various horizons in the soil due to evaporation of infiltrating rainfall that leach perchlorate from shallower depths and can ultimately migrate to groundwater.

In dilute concentrations typically found in groundwater like PGA-North, perchlorate behaves conservatively, with the center of mass of the plume moving at the same average velocity as the water. At higher concentrations, dispersion can result in the contaminant front actually moving faster than the average groundwater velocity. Based on empirical data from PGA-North monitor wells, the perchlorate concentration trends and fluctuations track almost identical to TCE, suggesting that both contaminants move with advective groundwater flow.

LOCAL GROUNDWATER OCCURRENCE AND FLOW DIRECTIONS

To put the evaluation of the local distribution of perchlorate in groundwater into the context of the local hydrogeology, the following section briefly summarizes the regional and local groundwater occurrence and flow directions.

Within the West Salt River Valley, groundwater occurs under generally unconfined conditions throughout most of the alluvial-filled basin. Previous investigations by the U.S. Bureau of Reclamation and Arizona Department of Water Resources (ADWR) divided the basin into three hydrogeologic units; the Upper Alluvial Unit (UAU), Middle Alluvial Unit (MAU) and the Lower Alluvial Unit (LAU). Each of the units is characterized by distinct hydrologic properties that vary in extent and thickness throughout the study area. At PGA-North and PGA-South, the UAU has been subdivided into Subunit A, Subunit B, and Subunit C.

Regionally, within the West Salt River Valley, groundwater flows radially inward towards an area of historic groundwater pumping known as the Luke Cone of depression. At PGA-North, the movement of groundwater over time from 1990 to present is empirically demonstrated by the extent of the TCE plumes in the Subunit A and Subunit C aquifers. The groundwater flow directions at PGA-North are influenced, in part, by the Luke Cone of Depression. Groundwater movement within the different subunits at PGA-North, PGA-South, and WA WQARF is briefly described below. A detailed summary of groundwater movement over time as well as the local hydrogeology at PGA-North can found in the *Final Subunit A Capture Zone Report* dated April 11, 2013 (AMEC 2013).

Subunit A

- In Subunit A, from 1990 to 2001, the groundwater flow direction at the PGA-North Site was to the north-northwest, generally toward the Luke Cone of Depression and toward local irrigation and remediation extraction wells (i.e. the former Globe wells and extraction well 33A). South of I-10, flow directions were predominantly toward the north with local flow toward extraction wells EA-01, EA-02, and EA-03. During this time, TCE migrated north and northwest with no eastern migration. The injection of treated groundwater at the Main Treatment System (MTS) injection well field during this time created a groundwater mound at the southern portion of PGA-North. The mounding resulted in steep hydraulic gradients and radial flow away from the points of injection.

- Between approximately 2001 and 2006, a northeasterly groundwater flow component developed in the area north of I-10 causing a divergence of groundwater flow in the area. As such, the TCE plume also expanded to the northeast. Since 2006, four additional extraction wells have been installed for groundwater treatment, and six additional injection wells have been installed to contain the northeastern expansion of the Subunit A TCE plume. Results of these efforts have created and maintained a groundwater mound in the northeast portion of the PGA-North Subunit A TCE plume. This has resulted in a northwest flow component west of Dysart Road toward the plume interior and remediation extraction wells (Figure 4).

- The ongoing reinjection of treated groundwater at the MTS has created a groundwater mound that has resulted in local changes in groundwater flow directions at the southern portion of PGA-North (Figure 4).

- South of PGA-North, outside the influence of the groundwater mound, groundwater flow in the WA WQARF Area shows a flow component to the west toward PGA-South and flow to the northwest toward PGA-North. At PGA-South, groundwater flow is toward the south and southwest, in part due to the pumping of remediation extraction wells (Figure 4).

- Typically, water in Subunit A is of poor quality with high concentrations of nitrate above the Maximum Contaminant Level (MCL) and high levels of TDS as a result of the heavy agriculture use in the area.

Subunit B

- Currently, four monitor wells screened in Subunit B exist at the PGA-North Site, based on data collected in August 2013, groundwater flows toward the north, similar to Subunit A. Additionally, Subunit B is a leaky aquitard. Based on Subunit C aquifer test data, there appears to be hydraulic connection and communication between the subunits at PGA-North.

Subunit C

- In Subunit C, from 1990 to present, the groundwater flow directions have been predominantly toward the northwest. However, some local variation is present near PGA-North extraction wells and water supply wells that are screened within the subunit. There appears to be a component of groundwater flow toward extraction well 33A north of I-10, most likely because extraction well 33A is partially screened in the upper portion of Subunit C and the pumping center located near the Luke Cone of Depression.

- Water levels and groundwater flow directions in Subunit C in the vicinity of the PGA-North Site can fluctuate substantially. These fluctuations are likely due to a combination of regional pumping variability (i.e., changes in regional pumping schedules), the pumping operations of local water supply wells, and the PGA-North remediation extraction wells. Figure 5 depicts the Subunit C potentiometry at a time when no water supply wells were operational. This is demonstrated by a dominant regional flow direction outside the capture zones from PGA-North extraction wells.

- At PGA-South, groundwater flow is primarily toward the northwest cross-gradient from PGA-North, with local variations near remediation extraction wells (Figure 5).

LOCAL DISTRIBUTION OF PERCHLORATE

PGA-South and the WA WQARF Site

The contamination associated with PGA-South is from the Goodyear Aerospace Corporation (GAC), which is a former subsidiary of Goodyear Tire and Rubber Company that began operation at the airport in 1942. The COCs for PGA-South have been identified as TCE and chromium. Perchlorate is not considered a COC.

The contamination associated with the WA WQARF Site was discovered as part of groundwater monitoring activities conducted at the nearby PGA-South Site. Tetrachloroethene (PCE) was detected in monitor wells located upgradient (east) of the PGA-South Site in 1993. Investigations conducted by the Arizona Department of Environmental Quality (ADEQ) have not identified the source of contamination. Similar to PGA-South, perchlorate is not considered a COC at this site.

Subunit A

Since perchlorate is not considered a COC at PGA-South and the WA WQARF Sites, there is little Subunit A data to establish perchlorate concentration trends and background concentrations. Based on a search of the PGA-North database, WA WQARF monitor wells MW-5 and MW-7 were sampled for perchlorate in December 2008. Concentrations of perchlorate were not identified above the laboratory detection limit of 2 µg/L in monitor well MW-5, however monitor well MW-7 was reported at a concentration of 3 µg/L.

Monitor well EMW-29A located between the PGA-North and PGA-South Sites was sampled by PGA-North from 2001 to 2011. During this time, detectable perchlorate concentrations ranged from 1.4 µg/L to 2.2 µg/L. PGA-South sampled monitor well EMW-29A once on August 12, 2008 with a result of <4 µg/L.

Based on this data and the dominant northwest groundwater flow direction in Subunit A outside the influence of the groundwater mound, the detectable perchlorate indicated in the WA WQARF monitor well MW-7 is likely from other anthropogenic or naturally occurring sources.

Subunit C
As part of the monitor well installation program at PGA-South, perchlorate samples were collected from several Subunit C monitor wells, GMW-09MC, GMW-13UC, GMW-14UC, GMW-16UC, GMW-17UC, GMW-18UC, GMW-19LC, and GMW-20LC and two water supply wells COG-05 and GAC-03. Samples were collected between December and March 2008 and in November 2011. Concentrations ranged from non-detect at multiple locations to 5.3 µg/L in monitor well GMW-18UC. A summary of the PGA-South perchlorate results is presented in Table 1.

Based on groundwater flow directions relative to PGA-North and the fact that perchlorate is not a COC at PGA-South, the detectable perchlorate from these wells is more than likely from other anthropogenic or naturally occurring sources.

PGA-North
The source of TCE and perchlorate at the PGA-North Site has been attributed to the disposal of TCE along with very small quantities of perchlorate at the former Main Dry Wells Source Area (MDWSA). The relatively low levels of perchlorate found in groundwater associated with the Phase II Groundwater Investigation (CH2M Hill 2004), the MDWSA investigation (ARCADIS 2007) and the data collected from onsite groundwater monitor wells, confirms that only small quantities were used at the facility. For example, the 2003 Phase II Investigation and the MDWSA investigation identified perchlorate above the HBGL in depth specific groundwater samples collected from soil borings drilled on the former UPI facility. Within Subunit A, perchlorate concentrations ranged from 2.7 µg/L to 200 µg/L. Within Subunit C perchlorate concentrations ranged from an estimated concentration of 1 µg/L J to 35 µg/L (CH2M Hill 2004).

The EPA Record of Decision (EPA 1989), established pump and treat as the selected remedy for PGA-North to treat TCE in groundwater. As of February 2013, 13 groundwater extraction wells pump an average of 2,800 gallons per minute primarily for treatment of TCE at five groundwater treatment systems (GTS) (MTS, 33A GTS, EA-05 GTS, EA-06 GTS, and EA-08 GTS) using both air stripping and liquid phase granular activated carbon technologies. Based on perchlorate concentration data, only water pumped from three of the eight onsite extraction wells (EA-01, EB-01, and PZ-01) require perchlorate treatment with an ion-exchange resin at the MTS. The treated water from the MTS, EA-05 GTS, and EA-06 GTS is conveyed to a series of injection wells to provide hydraulic control, replenish the aquifer, and protect water supply wells. Treated water from the 33A GTS is used for local golf course irrigation and discharged to the Roosevelt Irrigation District (RID) canal and EA-08 GTS is discharged into the RID canal.

To put the temporal aspects of treatment at PGA-North into context with respect to local perchlorate levels, the following is a chronological list of events related to groundwater treatment activities at PGA-North.

- In 1994 Phase I treatment for TCE at the MTS began.
- In 1996 Phase II/III groundwater treatment was added to the MTS for additional treatment of TCE.
  - Treated water from the MTS is conveyed to a series of injection wells at the southern portion of the site.
- In 1998 treatment activities at the 33A GTS began with the current treatment system.
- In August 1998, groundwater was sampled for perchlorate and was detected in area monitor wells.

- In November 2000, perchlorate analysis was incorporated into the groundwater monitoring program at the request of EPA.
- In October 2003 TCE treated water was discharged to the City of Goodyear (COG) waste water treatment plant (WWTP) for perchlorate treatment after extensive pilot testing.
- In April 2005, perchlorate treatment using an ion exchange process was added to the MTS. Injection of treated TCE and perchlorate water resumed at the MTS injection well field in Subunit A.
- In December 2007, groundwater treatment for TCE began at the EA-06 GTS with discharge into the RID Canal and to the golf course for irrigation.
- In March 2008, groundwater treatment for TCE began at the EA-05 GTS with injection into IA-10.
- In August 2010, injection wells IA-11 and IA-12 began receiving TCE treated water from the EA-06 GTS.
- In September 2010, extraction well EA-07 came online. Water is conveyed to the EA-06 GTS for TCE treatment and then conveyed to injection wells IA-11 and IA-12.
- In January 2011, injection well IA-13 began receiving TCE treated water from the EA-06 GTS.
- In December 2011, treatment activities at the EA-08 GTS began.

Based on review of the chronological events, since perchlorate historically was not a COC, from 1994 to 2003 perchlorate treatment was not required at the MTS and groundwater treated only for TCE was injected into Subunit A at the MTS injection well field. The earlier perchlorate concentrations in the MTS effluent are unknown, however from 2000 to 2003, perchlorate concentrations in the MTS effluent ranged from 14 µg/L to 73 µg/L. North of I-10, because perchlorate concentrations continue to be less than one half to one tenth of the HBGL (1.4 µg/L to 6.4 µg/L), groundwater extracted from extraction wells EA-05, EA-06, and EA-07 does not require perchlorate treatment and water treated for TCE is conveyed to the northeast area injection wells IA-10, IA-11, IA-12, and IA-13 for injection into Subunit A. Similarly, groundwater extracted from 33A and EA-08 does not require perchlorate treatment and is discharged into the RID Canal.

DISTRIBUTION AND TRENDS OF PERCHLORATE IN GROUNDWATER

The February 2013 PGA-North quarterly groundwater monitoring data as it relates to the distribution of perchlorate in groundwater is summarized below. For purposes of this technical memorandum, the PGA-North Site has been divided into four areas; 1) the area south of Van Buren Street; 2) the area between I-10 and Van Buren Street; 3) the northeast area; and 4) the northwest area. The February 2013 distribution of perchlorate in groundwater within Subunits A and C are graphically depicted in Figures 6 and 7, respectively. A summary of the February 2013 analytical results are presented in Table 2 and the concentration trend graphs for all PGA-North monitor wells through February 2013 are presented in Attachment A.

Area South of Van Buren Street

Subunit A

February 2013 groundwater analytical results indicate that this area contains the highest concentrations of perchlorate in Subunit A groundwater, as identified by monitor wells MW-04 (27.1 µg/L); MW-08 (40.1 µg/L); MW-09 (14 µg/L); and EPA MW-10A (24 µg/L). The perchlorate concentrations in these wells are equal to or above the HBGL of 14 µg/L and are more than likely related to past disposal practices at the former UPI facility. Sentinel wells continue to demonstrate detectable concentrations of perchlorate less than the HBGL and continue to define the southern, western, and eastern boundaries of the Subunit A perchlorate plume. Based on February 2013 and historic groundwater flow directions, the February 2013 and historic perchlorate concentrations, and location of sentinel wells MW-11, APS MW-03, EPA MW-6A, EPA MW-11A, and EPA MW-58A relative to the MTS groundwater mound, it is

inconclusive as to whether the concentrations in these wells are related to PGA-North or from other sources (Figure 6).

Subunit C
Similar to Subunit A, the February 2013 groundwater analytical results indicate that this area contains the highest concentration of perchlorate in Subunit C groundwater, as identified by monitor well EPA MW-3C with a concentration of 21 µg/L, which is above the HBGL. Perchlorate concentrations in onsite monitor wells EPA MW-1C (12.4 µg/L) and MW-23 (13.6 µg/L) are elevated but below the HBGL. Sentinel wells (EPA MW-26C, MW-06, EPA MW-5C, EPA MW-6C, MW-10, and MW-21) exhibit detectable concentrations of perchlorate less than the HBGL and continue to define the western, eastern, and southern boundaries of the Subunit C perchlorate plume (Figure 7). Based on the historic and February 2013 groundwater flow directions and the perchlorate concentrations presented herein, it is likely that the concentrations in sentinel wells EPA MW-26C, EPA MW-28C, EPA MW-5C, and MW-06 are related to PGA-North or from other sources. However, it is likely that the detectable perchlorate concentrations in upgradient sentinel well EPA MW-8C is not related to PGA-North. Conduit wells COG-04, COG-02, PSIW, and Goodyear Farms Well may also be one of several potential sources of perchlorate concentrations in Subunit C.

Area Between I-10 and Van Buren Street
Subunit A
February 2013 groundwater analytical results indicate that perchlorate in Subunit A groundwater in this area ranges in concentration from 1.7 µg/L in monitor well EPA MW-12A to 16 µg/L in monitor well MW-12, which is above the HBGL. Sentinel wells (EPA MW-27A, EPA MW-13A, EPA MW-56A, and EPA MW-48A) located within the footprint of the TCE plume continue to demonstrate detectable perchlorate concentrations less than the HBGL that range from 3.6 µg/L to 4.4 µg/L and continue to define the western, eastern, and northern boundaries of the Subunit A perchlorate plume. Sentinel wells MW-13, EPA MW-12A, EPA MW-46A, and EPA MW-57A located outside the footprint of the TCE plume indicate perchlorate concentrations that range from 1.7 µg/L to 3.0 µg/L (Figure 6). Based on historic and February 2013 groundwater flow directions and the perchlorate concentrations reported herein, it is likely that perchlorate concentrations in sentinel wells located within the footprint of the TCE plume are related to PGA-North or are from other sources. The detectable perchlorate concentrations in sentinel wells that are located outside the footprint of the TCE plume are more than likely not related to PGA-North.

Subunit C
February 2013 groundwater analytical results indicate that detectable perchlorate ranges from 1.6 µg/L in monitor wells MW-14 and EPA MW-19C to 11 µg/L in monitor well EPA MW-47C, which is below the HBGL (Table 2). Sentinel wells located within the footprint of the TCE plume continue to demonstrate detectable perchlorate concentrations less than the HBGL that range from 1.6 µg/L to 4.4 µg/L and continue to define the western, eastern, and northern boundaries of the Subunit C perchlorate plume (Figure 7). Sentinel wells MW-14, EPA MW-19C, EPA MW-12C, EPA MW-13C, EPA MW-48C, and MW-28 located outside the footprint of the TCE plume indicate perchlorate concentrations that range from 1.6 µg/L to 3.3 µg/L (Figure 7). Based on the historic and February 2013 groundwater flow directions and the perchlorate concentration data presented herein, it is likely that perchlorate concentrations in sentinel wells located within the footprint of the TCE plume are related to PGA-North or are from other sources. The detectable perchlorate concentrations in sentinel wells that are located outside the footprint of the TCE plume are more than likely not related to PGA-North.

Northeast Area

Subunit A

February 2013 groundwater analytical results indicate that the detectable perchlorate in Subunit A groundwater in the northeast ranges from 1.1 µg/L in monitor well EPA MW-39A to 3.0 µg/L in monitor well MW-25. Only two monitor wells, EPA MW-18A and EPA MW-31A, indicate perchlorate concentrations less than the laboratory reporting limit. Sentinel wells located within the footprint of the TCE plume continue to demonstrate detectable perchlorate concentrations less than the HBGL that range from 1.7 µg/L to 3.1 µg/L. Sentinel wells, EPA MW-36A, EPA MW-40A, EPA MW-59A, EPA MW-35A, EPA MW-45A, EPA MW-39A, EPA MW-55A, EPA MW-54A, EPA MW-43A, EPA MW-31A, EPA MW-18A, EPA MW-52A, EPA MW-53A, EPA MW-60A, and EPA MW-61A, located outside the footprint of the TCE plume indicate perchlorate concentrations that range from 1.1 µg/L to 3.5 µg/L. All monitor wells in the area continue to exhibit perchlorate concentrations below the HBGL and continue to define the perchlorate plume in the northeast (Figure 6). Based on historic and February 2013 groundwater flow directions, the perchlorate concentration data presented herein, and groundwater mounding from injection wells IA-10, IA-11, IA-12, and IA-13, it is inconclusive as to whether the February 2013 detectable perchlorate concentrations in sentinel wells that are located inside and outside the footprint of the TCE plume are related to PGA-North (Figure 7). However, prior to the commencement of injection activities, detectable perchlorate in sentinel wells ranged from 1.1 µg/L to 2.5 µg/L. As such, these historic concentrations suggest that perchlorate in monitor wells in this area is not related to PGA-North.

Subunit C

February 2013 groundwater analytical results indicate that the detectable perchlorate concentrations in Subunit C groundwater in the northeast area range from 1.3 µg/L in monitor well EPA MW-16C to 2.7 µg/L in irrigation well IR-3B. All Subunit C monitor wells in the northeast area continue to define the Subunit C perchlorate plume (Figure 7). Based on historic and February 2013 groundwater flow directions and the perchlorate concentration data presented herein, the detectable perchlorate concentrations in Subunit C monitor wells in this area are not related to PGA-North.

Northwest Area

Subunit A

February 2013 groundwater analytical results indicate that the detectable perchlorate in Subunit A groundwater in the northwest area ranges from 1.1 µg/L in monitor well EPA MW-44A to 3.4 µg/L in extraction well 33A. Only one monitor well (EPA MW-20A) indicated a perchlorate concentration less than the laboratory reporting limit. Sentinel wells located within the footprint of the TCE plume continue to demonstrate detectable perchlorate concentrations less than the HBGL that range from 1.4 µg/L to 3.4 µg/L. Sentinel wells EPA MW-44A, MW-17, EPA MW-17A, EPA MW-21A, MW-24, EPA MW-51A, EPA MW-32A, and EPA MW-37A, located outside the footprint of the TCE plume indicate perchlorate concentrations that range from 1.1 µg/L to 2.5 µg/L. All Subunit A monitor wells in the northwest area continue to define the Subunit A perchlorate plume (Figure 6). To understand the temporal history of perchlorate concentrations in the northwest area, trend graphs were created for monitor wells EPA MW-21A, MW-16, MW-19, MW-24, and MW-25 and extraction well 33A (Attachment B). Based on historic and February 2013 groundwater flow directions and the perchlorate concentration data presented herein, the detectable perchlorate concentrations in sentinel wells that are located outside the footprint of the TCE plume are more than likely not related to PGA-North. However, based on the evaluation of the trend graph for monitor well MW-24 and the age of the TCE mass that has been present in the northwest area, the perchlorate concentrations observed in MW-24 are likely related to PGA-North although monitor well MW-24 is located outside the footprint of the February 2013 TCE plume.

Subunit C
February 2013 groundwater analytical results indicate that the detectable perchlorate concentrations in Subunit C groundwater in this area range from 1.0 µg/L in monitor well MW-26 to 2.6 µg/L in monitor well EPA MW-24C. All Subunit C monitor wells in the area continue to define the Subunit C perchlorate plume (Figure 7). Based on historic and February 2013 groundwater flow directions and the perchlorate concentration data presented herein, the detectable perchlorate concentrations in sentinel wells are not related to PGA-North.

Water Supply Wells
As part of the ongoing monitoring activities at PGA-North, groundwater samples are collected for perchlorate analysis from 11 irrigation and water supply wells in the area. Most of these wells are screened within Subunit C and the MAU. Two wells, irrigation well IR-3B and drinking water supply well COA-18, are also screened with Subunit A. All of these irrigation and water supply wells are located outside the footprint of the February 2013 PGA-North Subunit A and Subunit C TCE plumes.

February 2013 groundwater analytical results indicate perchlorate concentrations range from <0.78 µg/L to 4.8 µg/L (Figure 7). Based on the historic and February 2013 groundwater flow directions and the depths to which these wells are screened, the detectable perchlorate concentrations in these irrigation and water supply wells are not related to PGA-North but from other anthropogenic or naturally occurring sources.

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY STUDY
In 2004, the ADEQ collected and analyzed over 100 water samples from various locations to determine the extent to which perchlorate has impacted Arizona's surface water and groundwater resources. Special attention was made to sampling sites where perchlorate use occurred and sites that had the potential for extensive direct and indirect recharge of Colorado River water throughout central Arizona, beginning in the early 1990s. During this time period, it is likely that these recharge areas may have had the unintended consequence of dispersing perchlorate contamination in the subsurface. As such, sampling locations included surface water, groundwater, agriculture irrigation water, groundwater recharge facilities, wastewater treatment plant effluent, and manmade water impoundments. The results of this study indicate perchlorate concentrations ranging from <2 µg/L to 7.4 µg/L, one groundwater sample from a monitor well in Yuma detected perchlorate at 15 µg/L (ADEQ 2004). Detectable concentrations of perchlorate were also found along the Colorado River from Lake Mead to Yuma and along the CAP canal route. The February 2013 distribution of perchlorate in groundwater at PGA-North and the results from ADEQ that are within the study area are graphically depicted in Figure 8.

A similar study was conducted by ADEQ in 1999 at many of the same sample locations as the 2004 study. The results of the 1999 study showed perchlorate concentrations ranging from 480 µg/L at Lake Mead to 11 µg/L and <2 µg/L along the main stem of the Colorado River and CAP canal (ADEQ 2004). A brief summary of the 2004 study results are presented below.

Surface Water
A total of 41 surface water samples were collected from surface water impoundments, canals, rivers, reservoirs, and manmade urban impoundments. The results from the surface water samples indicated that 24 of 41 samples contained detectable perchlorate at concentrations that range from 2.0 µg/L, at Lake Pleasant at a depth of approximately 14 feet, to 6.0 µg/L at Lake Mead (ADEQ 2004).

Groundwater

A total of 35 groundwater samples were collected as part of this study. The sampling focused on wells used for domestic and municipal water supplies along the Colorado River from Bullhead City to Yuma, wells in areas utilizing CAP water for irrigation or livestock watering, and wells near concentrated animal feeding operations. Of these 35 samples collected, four samples had results above the detection limit of 2 µg/L. One sample near Buckeye was slightly above the detection limit at 2.5 µg/L. The other three samples with results above the detection limit ranging from 3.4 µg/L to 15.0 µg/L, were found in monitor wells in the Yuma area and are adjacent to agricultural lands irrigated with Colorado River water (ADEQ 2004).

Groundwater Recharge Facilities

Sixteen samples were collected from nine groundwater recharge facilities representing different types of source water (e.g., Colorado River water and effluent) and recharge methods (e.g., basins and wells) as part of this study. Four of these samples were collected from surface water impoundments and recharge basins located along the Agua Fria River Channel, the CAP canal located at 99th Avenue, and the City of Peoria WWTP recharge facility located north of PGA-North. All of these recharge projects serve as a central component for municipal and state water banking strategies, whereby excess Colorado River water is stored in underground aquifers for use during times of drought, or excess treated effluent is stored for recovery during times of higher demand.

The results of these samples indicated that eight of 16 samples contained detectable perchlorate that ranged from 2.3 µg/L to 4.8 µg/L. Samples collected from the Agua Fria Recharge Areas and CAP canal north of PGA-North indicated concentrations that ranged from 4.3 µg/L to 4.8 µg/L (Table 3). The City of Peoria Beardsley recharge facility results were not above the detection limit of 2 µg/L (ADEQ 2004).

WEB BASED SEARCH FOR PERCHLORATE IN ARIZONA

A web based search using a GIS software program called HydroDeskTop (Ames, D.P., Horsburgh, et al. 2012) supported by the Consortium of Universities for the Advancement of Hydrological Sciences (CUAHSI) evaluated various online databases to search for additional perchlorate data within Arizona. The results of the search indicated that eight additional locations within the study area were sampled for perchlorate in 2008. Although it is difficult to ascertain the exact location of these samples, they all appear to be near the CAP canal. The results show detectable perchlorate at concentrations that range from 0.8 µg/L to 2.4 µg/L (Figure 8).

SUMMARY AND CONCLUSIONS

Based on the evaluation of perchlorate summarized herein, the following conclusions are presented:

- Detectable perchlorate concentrations in soil and groundwater can occur from naturally occurring sources. USGS studies have shown that there is widespread natural perchlorate in unsaturated zones in the Atacama Desert in Chile and the deserts of the southwestern U.S.

- Due to the heavy agricultural activities that occurred in the West Salt River Valley from the early 1900s to present, it is reasonable to presume that Chilean fertilizers were used in the Goodyear and Avondale areas where high nitrate levels in groundwater are present.

- The 2004 ADEQ study identified detectable perchlorate that ranged from <2 µg/L to 4.8 µg/L in CAP canal and several recharge areas north of PGA-North that are related to the distribution and recharge of Colorado River water, which is also used for irrigation of agriculture over large areas of southern Arizona.

- North of I-10, perchlorate concentrations in PGA-North monitor wells are similar to those found in water supply wells that are located outside the footprint of the PGA-North TCE plumes, PGA-South wells, and WA WQARF wells where perchlorate is not considered a COC.

Perchlorate concentrations in PGA-North Subunit A and Subunit C monitor wells that are above the HBGL of 14 µg/L reside within the footprint of the TCE plume and are limited to the area south of I-10. The elevated perchlorate levels detected in these monitor wells is related to activities associated with the former UPI facility. However, based on the ADEQ study and the studies of others, it is clear that there may be several historical sources of perchlorate that are also affecting groundwater quality within the area containing the PGA-North, PGA-South, and WA WQARF Sites. The source of these low levels of perchlorate outside of the footprint of PGA-North TCE plumes is unclear, though it is possible that the perchlorate in these areas is from either past agricultural practices associated with the use of Chilean fertilizers, natural occurrences in the desert environment, and/or the use of CAP delivered Colorado River water in nearby recharge facilities used for irrigation and does not appear to be a result of the operations at the former UPI facility.

Please call me at (480) 322-1474 if you have any questions or need additional information.

Sincerely,

Harry Brenton, RG
Director of Hydrogeological Services

Jody Lee Mack
QA/QC Manager

List of Attachments:

Table 1	Summary of Perchlorate Results - PGA-South Superfund Site
Table 2	February 2013 Perchlorate Results - PGA-North Superfund Site
Table 3	Groundwater Recharge Facilities - ADEQ Study
Figure 1	Study Area Map
Figure 2	Site Location Map with Perchlorate & TCE Plume: Subunit A
Figure 3	Site Location Map with Perchlorate & TCE Plume: Subunits B, C, and MAU
Figure 4	Potentiometric Surface Contour, Subunit A February 5-7, 2013
Figure 5	Potentiometric Surface Contour, Subunit C, February 5-7, 2013
Figure 6	Perchlorate Distribution, Subunit A
Figure 7	Perchlorate Distribution, Subunits B, C, and MAU
Figure 8	Perchlorate Distribution, PGA-North & 2004 ADEQ Samples
Attachment A	Perchlorate Concentration Trend Graphs
Attachment B	Hydrograph and Perchlorate Concentration Trend Graphs for Northwest Area Monitor Wells

Copy to: Addressee (electronic)
Patrick Shinabery, ADEQ (**1 paper** and electronic)
Larry Phillips, Innovative Technical Solutions (**1 paper** and electronic)
Anthony Pantaleoni, PhD, Crane Co. (electronic)
Alan F. Bilzi, Environmental Venture Group, Inc. (electronic)

David J. Becker, PG, US Army Corps of Engineers (electronic)
Mark Holmes, City of Goodyear (electronic)
Tom Suriano, Clear Creek Associates (electronic)

Table 1
Summary of Perchlorate Results
Phoenix-Goodyear Airport - South Superfund Site
Goodyear, Arizona

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Updated: March 20, 2013

Well ID	Subunit	Sample Collection Date	Perchlorate (µg/L)
GAC-04		04/02/2009	3.9
EMW-29A	A	08/12/2008	<4 U
COG-05	C	11/20/2009	<8 U
		02/05/2010	<8 U
		05/04/2010	<8 U
		08/31/2010	<4 U
		08/31/2010	<4 U
		08/31/2010	<4 U
		08/31/2010	<4 U
		08/03/2011	2.1 J
GAC-03	C	12/17/2009	1.9 J
		02/24/2010	2.4 J
		02/24/2010	2.6 J
		05/18/2010	1.3 J
		08/19/2010	2.2 J
		08/19/2010	2.2 J
		12/02/2010	3.5 J
		12/02/2010	3.5 J
GMW-09MC	C	08/09/2011	4.6
GMW-13UC	C	11/21/2009	<8 U
		02/04/2010	1.1 J
		02/04/2010	2.2 J
		05/05/2010	<4 U
		05/05/2010	<4 U
		09/01/2010	<8 U
		09/01/2010	<8 U
		12/08/2010	2.1 J
		12/08/2010	2.1 J
		08/11/2011	<4 U

Table 1
Summary of Perchlorate Results
Phoenix-Goodyear Airport - South Superfund Site
Goodyear, Arizona

Updated: March 20, 2013

Well ID	Subunit	Sample Collection Date	Perchlorate (µg/L)
GMW-14UC	C	11/21/2009	1.7 J
		02/04/2010	2.6 J
		02/04/2010	2.9 J
		05/05/2010	1.8 J
		08/31/2010	3.5 J
		08/31/2010	3.4 J
		08/31/2010	3.4 J
		08/31/2010	3.5 J
		08/10/2011	3.8 J
GMW-16UC	C	02/05/2010	1.1 J
		05/05/2010	<4 U
		08/31/2010	1.5 J
		08/31/2010	1.5 J
GMW-17UC	C	11/20/2009	1.9 J
		02/05/2010	3.1 J
		05/04/2010	2.2 J
		08/28/2010	3.5 J
		08/28/2010	3.5 J

Table 1
Summary of Perchlorate Results
Phoenix-Goodyear Airport - South Superfund Site
Goodyear, Arizona

Updated: March 20, 2013

Well ID	Subunit	Sample Collection Date	Perchlorate (µg/L)
GMW-18UC	C	03/23/2009	5.3
		03/24/2009	4.4
		03/24/2009	4.4
		03/24/2009	4.7
		03/25/2009	1.4 J
		03/31/2009	4.1
		08/29/2009	<8 U
		11/20/2009	<8 U
		12/16/2009	<8 U
		02/04/2010	<8 U
		05/04/2010	<8 U
		08/30/2010	<8 U
		08/30/2010	<8 U
		12/05/2010	2.5 J
		12/05/2010	2.5 J
		02/13/2011	<8 U
		08/10/2011	0.96 J
		11/14/2011	<4 U

Table 1
Summary of Perchlorate Results
Phoenix-Goodyear Airport - South Superfund Site
Goodyear, Arizona

Updated: March 20, 2013

Well ID	Subunit	Sample Collection Date	Perchlorate (µg/L)
GMW-19LC	C	03/17/2009	1.4 J
		03/18/2009	2.9
		03/18/2009	2.6
		03/18/2009	2.6
		03/19/2009	1.7 J
		03/30/2009	2.1
		11/20/2009	<4 U
		11/20/2009	<4 U
		02/06/2010	<4 U
		02/06/2010	<4 U
		05/05/2010	<4 U
		09/01/2010	1.9 J
		09/01/2010	1.9 J
		12/07/2010	2.6 J
		12/07/2010	2.6 J
		12/07/2010	<8 U
		12/07/2010	<8 U
		02/15/2011	<8 U
		08/11/2011	1.3 J
		11/14/2011	<4 U

Table 1
Summary of Perchlorate Results
Phoenix-Goodyear Airport - South Superfund Site
Goodyear, Arizona

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Updated: March 20, 2013

Well ID	Subunit	Sample Collection Date	Perchlorate (µg/L)
GMW-20LC	C	12/05/2008	2.1
		12/05/2008	1.7 J
		12/05/2008	1.8 J
		12/05/2008	1.7 J
		12/09/2008	2.4
		12/16/2008	2.2
		01/22/2009	1.8 J
		11/18/2009	1.3 J
		02/02/2010	<4 U
		05/03/2010	<4 U
		05/03/2010	<4 U
		08/27/2010	<4 U
		08/27/2010	<4 U
		08/27/2010	<4 U
		08/27/2010	<4 U
		12/04/2010	2.1 J
		12/04/2010	2.1 J
		02/10/2011	<4 U
		08/09/2011	<4 U
		11/12/2011	<4 U

Notes:
Concentrations reported in micrograms per liter (µg/L).

Abbreviations:

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U - The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Table 2
February 2013 Perchlorate Results
Phoenix-Goodyear Airport - North Superfund Site
Goodyear, Arizona

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Updated: April 3, 2013

Well ID	Subunit	Type	Sample Collection Date	Perchlorate (µg/L)
Subunit A Monitor Wells				
APS MW-03	A	N	02/27/2013	1.6 J
EA-04	A	N	02/23/2013	**14**
EPA MW-1A	A	N	02/21/2013	**21.8**
EPA MW-6A	A	N	02/12/2013	1.2 J
EPA MW-7A	A	N	02/27/2013	7.6
EPA MW-10A	A	N	02/14/2013	**25**
		FD	02/14/2013	**24**
EPA MW-11A	A	N	02/26/2013	3.0
EPA MW-12A	A	N	02/12/2013	1.7 J
EPA MW-13A	A	N	02/12/2013	3.6 J
EPA MW-16A	A	N	02/23/2013	1.7 J
EPA MW-17A	A	N	02/15/2013	1.9 J
EPA MW-18A	A	N	02/16/2013	<0.78 U
EPA MW-20A	A	N	02/15/2013	<0.78 U
EPA MW-21A	A	N	02/22/2013	2.5 J
EPA MW-23A	A	N	02/23/2013	2.2
		FD	02/23/2013	2.2
EPA MW-25A	A	N	02/15/2013	1.7 J
EPA MW-26A	A	N	02/27/2013	2.4
		FD	02/27/2013	2.8

Table 2
February 2013 Perchlorate Results
Phoenix-Goodyear Airport - North Superfund Site
Goodyear, Arizona

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Updated: April 3, 2013

Well ID	Subunit	Type	Sample Collection Date	Perchlorate (µg/L)
EPA MW-27A	A	N	02/28/2013	3.6
EPA MW-28A	A	N	02/13/2013	1.5 J
EPA MW-30A	A	N	02/23/2013	1.6 J
EPA MW-31A	A	N	02/16/2013	<0.78 U
EPA MW-32A	A	N	02/15/2013	1.1 J
EPA MW-34A	A	N	02/23/2013	1.3 J
		FD	02/23/2013	0.92 J
EPA MW-35A	A	N	02/22/2013	1.5 J
EPA MW-36A	A	N	02/16/2013	3.4
EPA MW-37A	A	N	02/15/2013	1.1 J
EPA MW-38A	A	N	02/14/2013	3.2
EPA MW-39A	A	N	02/22/2013	1.1 J
EPA MW-40A	A	N	02/16/2013	<0.78 U
		FD	02/16/2013	<0.78 U
EPA MW-41A	A	N	02/16/2013	3.5
EPA MW-42A	A	N	02/15/2013	1.4 J
EPA MW-43A	A	N	02/23/2012	1.7 J
EPA MW-44A	A	N	02/15/2013	1.1 J
EPA MW-45A	A	N	02/22/2013	2.2
EPA MW-46A	A	N	02/19/2013	2.8 J
EPA MW-47A	A	N	02/12/2013	10

Table 2
February 2013 Perchlorate Results
Phoenix-Goodyear Airport - North Superfund Site
Goodyear, Arizona

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Updated: April 3, 2013

Well ID	Subunit	Type	Sample Collection Date	Perchlorate (µg/L)
EPA MW-48A	A	N	02/21/2013	4.4
		FD	02/21/2013	4.3
EPA MW-50A	A	N	02/23/2013	1.9 J
EPA MW-51A	A	N	02/12/2013	1.5 J
EPA MW-52A	A	N	02/16/2013	2.5
EPA MW-53A	A	N	02/16/2013	1.3 J
EPA MW-54A	A	N	02/22/2013	2.2
EPA MW-55A	A	N	02/22/2013	2.2
EPA MW-56A	A	N	02/21/2013	4.0
EPA MW-57A	A	N	02/19/2013	2.2 J
EPA MW-58A	A	N	02/14/2013	3.2
EPA MW-59A	A	N	02/23/2013	<0.78 U
EPA MW-60A	A	N	02/23/2013	1.5 J
EPA MW-61A	A	N	02/22/2013	1.9 J
		FD	02/22/2013	2.9
EPA MW-62A	A	N	02/14/2013	2.3
MW-01	A	N	02/19/2013	3.5
MW-02	A	N	02/21/2013	4.3
MW-03	A	N	02/21/2013	8.0
MW-04	A	N	02/21/2013	**27.1**
MW-08	A	N	02/12/2013	**40**

Table 2
February 2013 Perchlorate Results
Phoenix-Goodyear Airport - North Superfund Site
Goodyear, Arizona

Updated: April 3, 2013

Well ID	Subunit	Type	Sample Collection Date	Perchlorate (µg/L)
MW-09	A	N	02/28/2013	**14**
		FD	02/28/2013	**14**
MW-11	A	N	02/12/2013	2.0
MW-12	A	N	02/23/2013	**16**
MW-13	A	N	02/26/2013	3.0
MW-15	A	N	02/27/2013	2.5
MW-16	A	N	02/27/2013	4.4
MW-17	A	N	02/15/2013	1.6 J
MW-18	A	N	02/15/2013	2.1
MW-19	A	N	02/23/2013	1.2 J
MW-24	A	N	02/12/2013	0.89 J
MW-25	A	N	02/27/2013	3.0
MW-27	A	N	02/22/2013	3.4
IR-34B	A	N	02/27/2013	2.6
IRZ MW-C	A	N	02/28/2013	3.6
Subunit B Monitor Well				
OW-B	B	N	02/12/2013	3.7 J
Subunit C Monitor Wells				
EPA MW-1C	C	N	02/21/2013	12.4
EPA MW-2C	C	N	02/14/2013	3.3
EPA MW-3C	C	N	02/21/2013	**21.0**

Table 2
February 2013 Perchlorate Results
Phoenix-Goodyear Airport - North Superfund Site
Goodyear, Arizona

Updated: April 3, 2013

Well ID	Subunit	Type	Sample Collection Date	Perchlorate (µg/L)
EPA MW-4C	C	N	02/26/2013	2.3
EPA MW-5C	C	N	02/21/2013	6.8
EPA MW-6C	C	N	02/21/2013	5.8 J
EPA MW-8C	C	N	02/27/2013	1.9 J
EPA MW-9C	C	N	02/14/2013	2.3
EPA MW-10C	C	N	02/14/2013	2.3
EPA MW-12C	C	N	02/12/2013	3.3
EPA MW-13C	C	N	02/12/2013	2.1
EPA MW-14C	C	N	02/23/2013	2.3
EPA MW-15C	C	N	02/19/2013	2.5 J
EPA MW-16C	C	N	02/22/2013	1.3 J
EPA MW-17C	C	N	02/16/2013	1.2 J
EPA MW-19C	C	N	02/13/2013	1.6 J
EPA MW-22C	C	N	02/15/2013	1.5 J
EPA MW-24C	C	N	02/15/2013	2.3 J
		FD	02/15/2013	2.6 J
EPA MW-26C	C	N	02/12/2013	2.5
EPA MW-27C	C	N	02/27/2013	1.6 J
EPA MW-28C	C	N	02/13/2013	3.9 J
EPA MW-39C	C	N	02/22/2013	1.1 J
EPA MW-40C	C	N	02/16/2013	<0.78 U

Table 2
February 2013 Perchlorate Results
Phoenix-Goodyear Airport - North Superfund Site
Goodyear, Arizona

Updated: April 3, 2013

Well ID	Subunit	Type	Sample Collection Date	Perchlorate (µg/L)
EPA MW-47C	C	N	02/12/2013	11
EPA MW-48C	C	N	02/19/2013	2.7 J
EPA MW-49C	C	N	02/27/2013	3.4
MW-06	C	N	02/21/2013	3.4
MW-10	C	N	02/12/2013	2.8
MW-14	C	N	02/26/2013	1.6 J
MW-21	C	N	02/21/2013	2.6 J
MW-23	C	N	02/21/2013	13.3
		FD	02/21/2013	13.6
MW-26	C	N	02/22/2013	1.0 J
MW-28	C	N	02/26/2013	3.0
OW-C	C	N	02/12/2013	1.3 J
MAU Monitor Wells				
EPA MW-1M	M	N	02/19/2012	<0.31 U
EPA MW-28M	M	N	02/12/2013	<0.78 U
Irrigation Wells				
AEIW	B/C	N	02/26/2013	2.1
IR-3B	A/B/C/M	N	02/28/2013	2.7
IR-26A	A/B/C/M	N	02/23/2012	2.0
Golf Course Lake	A/B/C/M	N	02/27/2013	2.6
LPW-894	C	N	02/26/2013	1.4 J

Table 2
February 2013 Perchlorate Results
Phoenix-Goodyear Airport - North Superfund Site
Goodyear, Arizona

Updated: April 3, 2013

Well ID	Subunit	Type	Sample Collection Date	Perchlorate (µg/L)
PSDW	C	N	02/26/2013	4.6
		FD	02/26/2013	4.8
Drinking Water Wells				
COG-03	C	N	02/14/2013	2.1
COG-18A	C/M	N	02/15/2013	1.6 J
COG-18B	M	N	02/15/2013	<0.78 U
COA-15	C/M	N	02/25/2013	2.1
COA-18	A/B/C/M	N	02/25/2013	1.8 J
Subunit A Extraction Wells				
EA-01	A	N	02/12/2013	7.5
EA-02	A	N	02/27/2013	4.3
EA-03	A/B	N	02/12/2013	2.2
PZ-01	A/B	N	02/12/2013	12
EA-05	A	N	02/04/2013	3.1
EA-06	A	N	02/23/2013	1.8 J
EA-07	A	N	02/23/2013	1.4 J
EA-08	A	N	02/04/2013	2.5
33A	A/B/C	N	02/04/2013	3.4
Subunit B Extraction Well				
EB-01	B	N	02/12/2013	**15**

Table 2
February 2013 Perchlorate Results
Phoenix-Goodyear Airport - North Superfund Site
Goodyear, Arizona

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Updated: April 3, 2013

Well ID	Subunit	Type	Sample Collection Date	Perchlorate (µg/L)
Subunit C Extraction Wells				
EC-01	C	N	02/12/2013	3.7
MW-20	C	N	02/12/2013	6.2
MW-29	C	N	02/08/2013	4.4

Notes:

Concentrations reported in micrograms per liter (µg/L).

Bold values indicates above site specific remediation goals.

Perchlorate site specific remediation goal is 14 µg/L.

Abbreviations:

N - Normal Sample

FD - Field Duplicate Sample

< less than

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U - The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

UJ - The analyte is estimated and non-detect at the reporting limits stated.

Updated: April 3, 2013

Site Location	Sample Collection Date	Perchlorate (µg/L)	RL (µg/L)
ADEQ Study Results			
Lake Pleasant at depth	06/29/2004	2.0	2
CAP Canal Below Lake Pleasant	02/10/2004	3.0	2
Agua Fria Managed Recharge Project (MW-2)	07/27/2004	4.8	2
Agua Fria Managed Recharge Project (MW-3)	07/27/2004	4.3	2
CAP Canal @ 99th Avenue	06/22/2004	4.2	2
City of Peoria Beardsley Recharge (MW-2)	07/06/2004	ND	2

Notes:
Concentrations reported in micrograms per liter (µg/L).

Abbreviations:
RL - Reporting Limit
ND - Not Detected

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TABLES

FIGURES

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ATTACHMENT A

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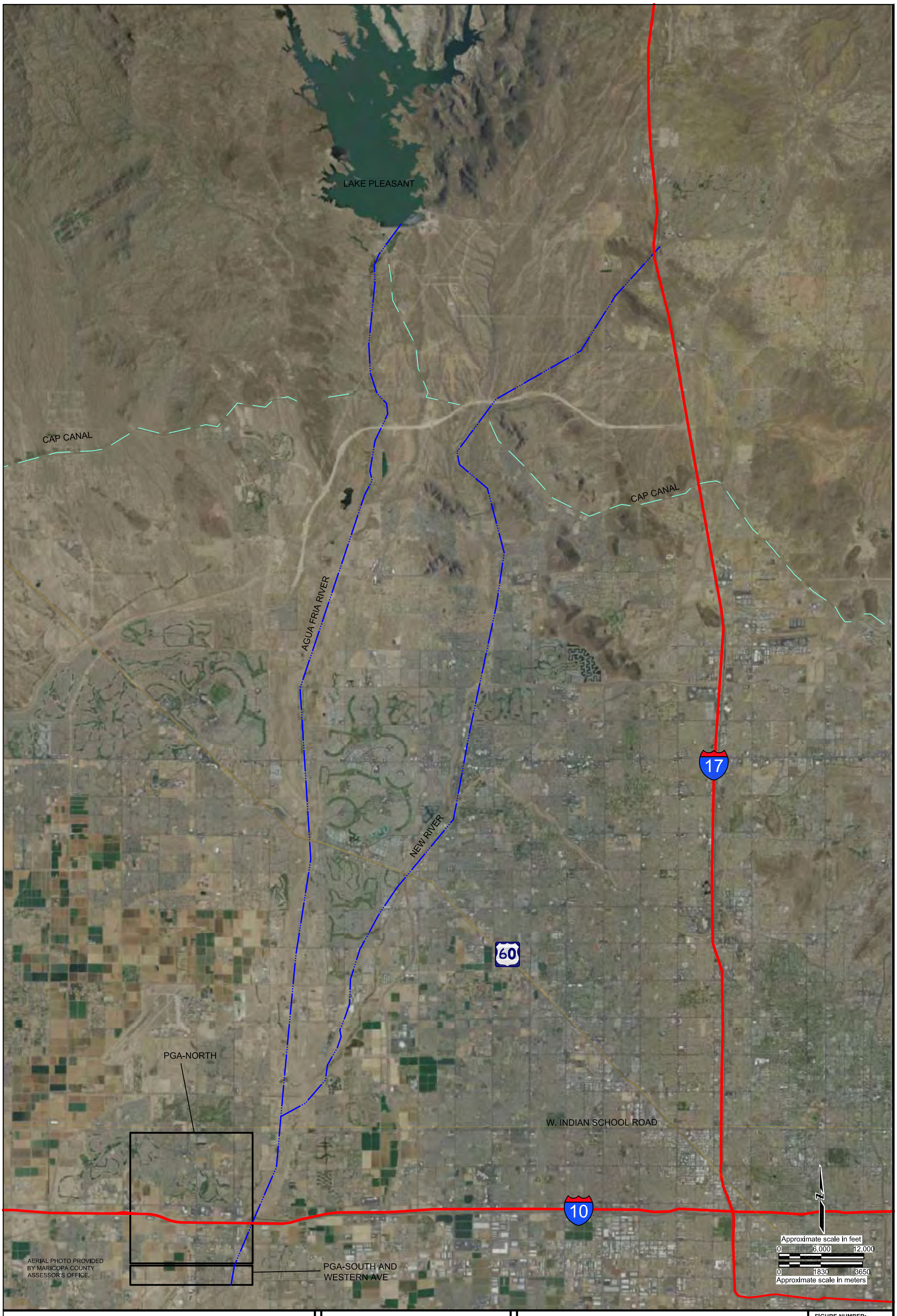
ATTACHMENT B



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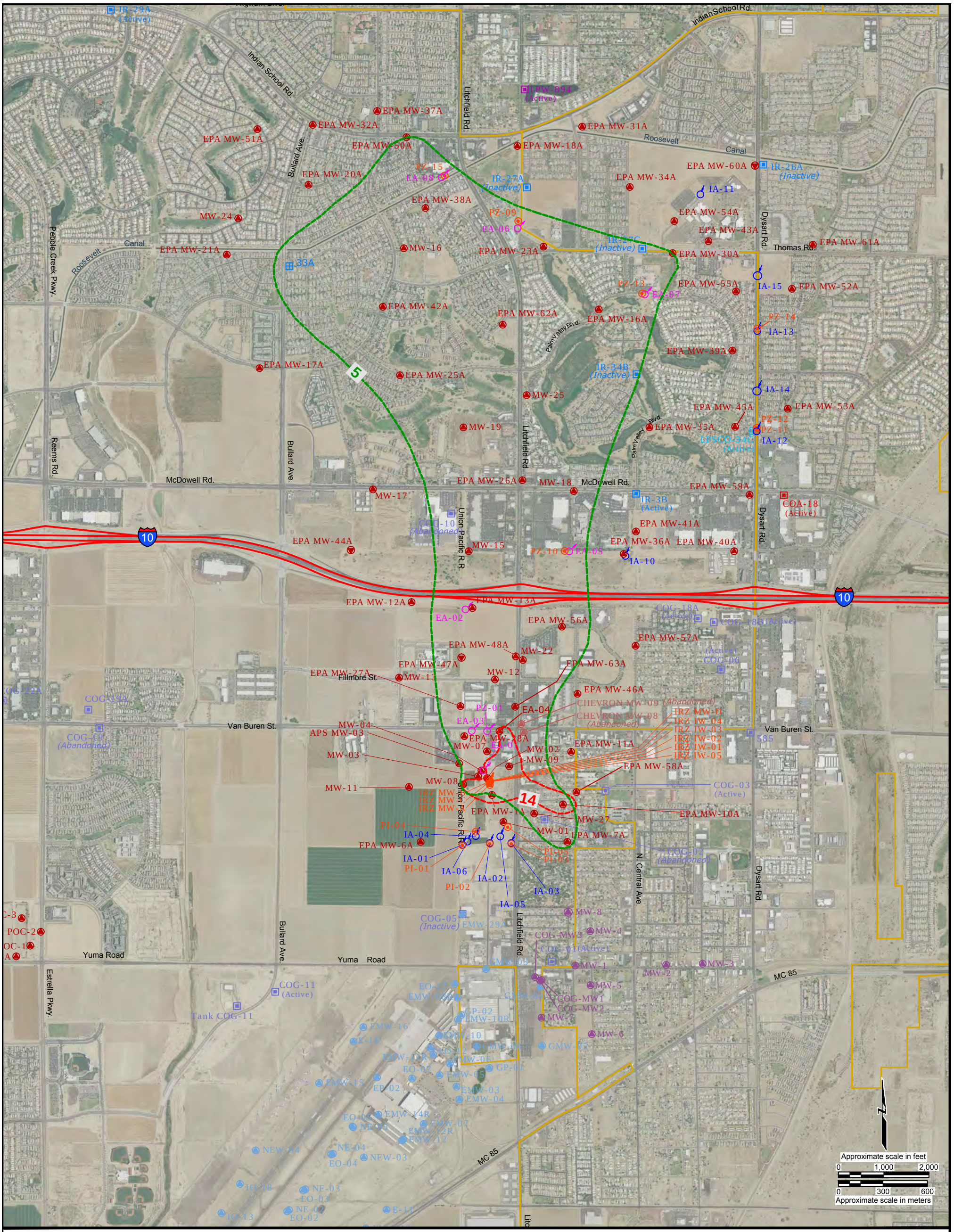
STUDY AREA MAP

DRAWN BY:	DESIGNED BY:	APPROVED BY:	PROJECT NUMBER:
LM	HB	HB	13-100E-01
DATE:	DATE:	DATE:	SCALE:
3-21-2013	3-21-2013	3-21-2013	1"=2000'

FIGURE NUMBER:

1



Explanation

- EPA MW-55A — Subunit A monitor well
- EA-07 — Subunit A extraction well
- EMW-29A — Subunit A monitor well - PGA - South site
- COA MW1 — Subunit A monitor well Western Ave. Plume site
- PZ-13 — Piezometer
- IRZ IW-01 — Injection well (IRZ)
- IA-13 — Injection well (treated water)
- 33A — UPI treatment system well
- IR-3B — Irrigation well
- COG-18A — City of Goodyear supply well
- LPSCO-34C — Litchfield Park Services Co. production well
- COA-02 — City of Avondale supply well
- TW-1 — Algonquin water services well
- PSDW — Park Shadows production well
- LPW-894 — City of Litchfield Park supply well
- Groundwater elevation in feet above mean sea level (MSL)
- —14— Isocontour showing Perchlorate concentration in µg/L. dashed where inferred. Based on February 2013 Sampling Event.
- — 5 — Isocontour showing TCE concentration in µg/L. dashed where inferred. Based on February 2013 Sampling Event.

EXTRACTION RATE SUMMARY
FEBRUARY 2013

WELL	PUMP RATE (gpm)
EA-01	80
EB-01	34
EA-02	19
EA-03	76
EC-01	115
MW-20	50
MW-29	71
PZ-01	87
33A	536
EA-05	400
EA-06	423
EA-07	297
EA-08	397

The extraction rate shown was the average rate based on readings from January 30, 2013 to February 27, 2013.

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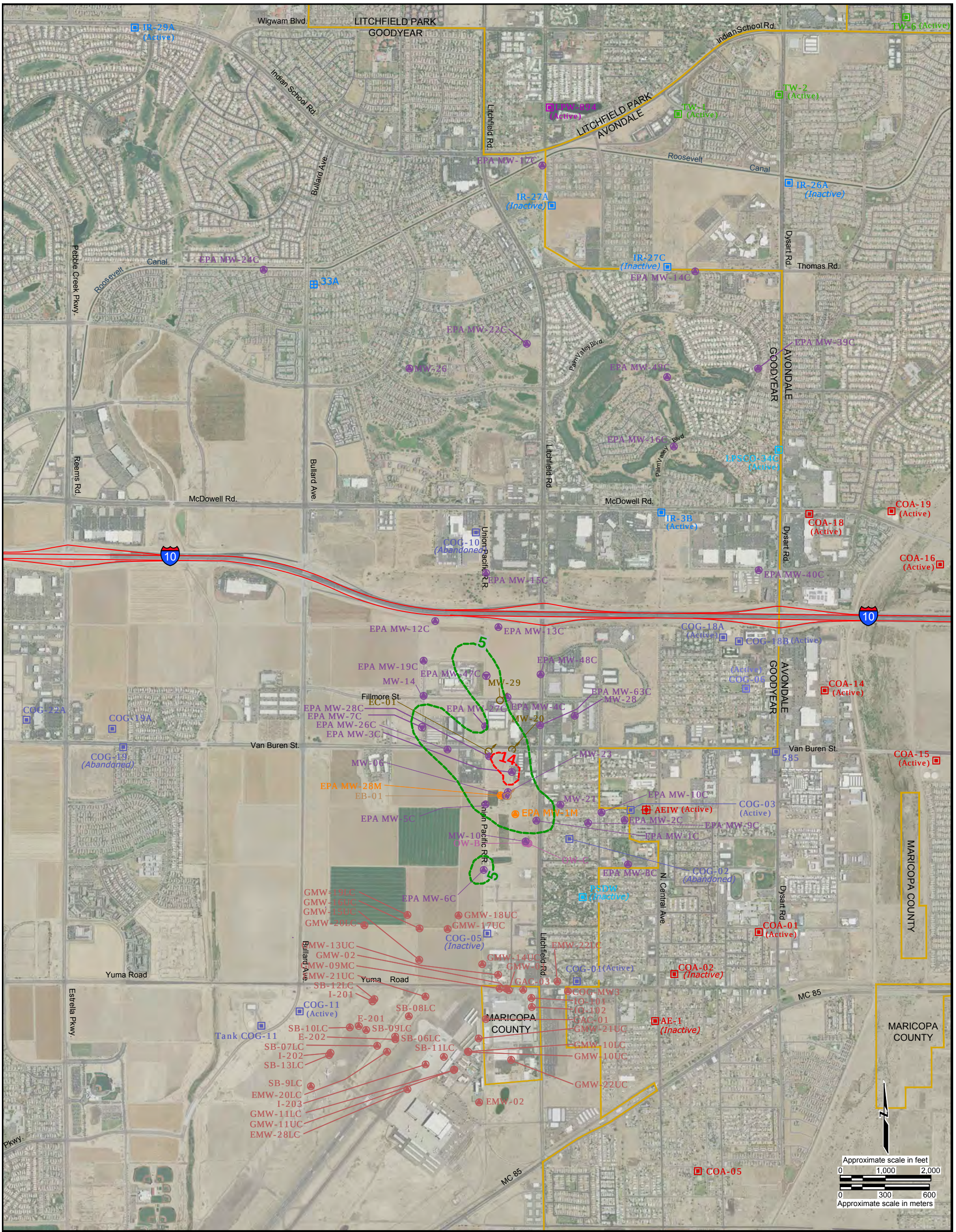
SITE LOCATION MAP WITH PERCHLORATE & TCE PLUME: SUBUNIT A

DRAWN BY:	DESIGNED BY:	APPROVED BY:	PROJECT NUMBER:
LM	HB	HB	13-100E-01
DATE: 3-21-2013	DATE: 3-21-2013	DATE: 3-21-2013	SCALE: 1"=2000'

FIGURE NUMBER: 2



Explanation

- 33A — UPI treatment system well
- IR-3B — Irrigation well
- COG-18A — City of Goodyear supply well
- LPW-894 — City of Litchfield Park supply well
- LPSCO-34C — Litchfield Park Services Co. production well
- EPA MW-48C — Subunit C monitor well
- EPA MW-28M — MAU monitor well
- EB-01 — Subunit B extraction well
- EC-01 — Subunit C extraction well
- COG-MW3 — Subunit C monitor well - PGA - South site
- OW-B — Observation well
- COA-02 — City of Avondale supply well
- AEIW — Avondale Elementary irrigation well
- TW-1 — Algonquin water services well
- PSDW — Park Shadows production well

—14— Isocontour showing Perchlorate concentration in µg/L. dashed where inferred. Based on February 2013 Sampling Event.

— 5 — Isocontour showing TCE concentration in µg/L. dashed where inferred. Based on February 2013 Sampling Event.

EXTRACTION RATE SUMMARY
FEBRUARY 2013

WELL	PUMP RATE (gpm)
EA-01	80
EB-01	34
EA-02	19
EA-03	76
EC-01	115
MW-20	50
MW-29	71
PZ-01	87
33A	536
EA-05	400
EA-06	423
EA-07	297
EA-08	397

The extraction rate shown was the average rate based on readings from January 30, 2013 to February 27, 2013.

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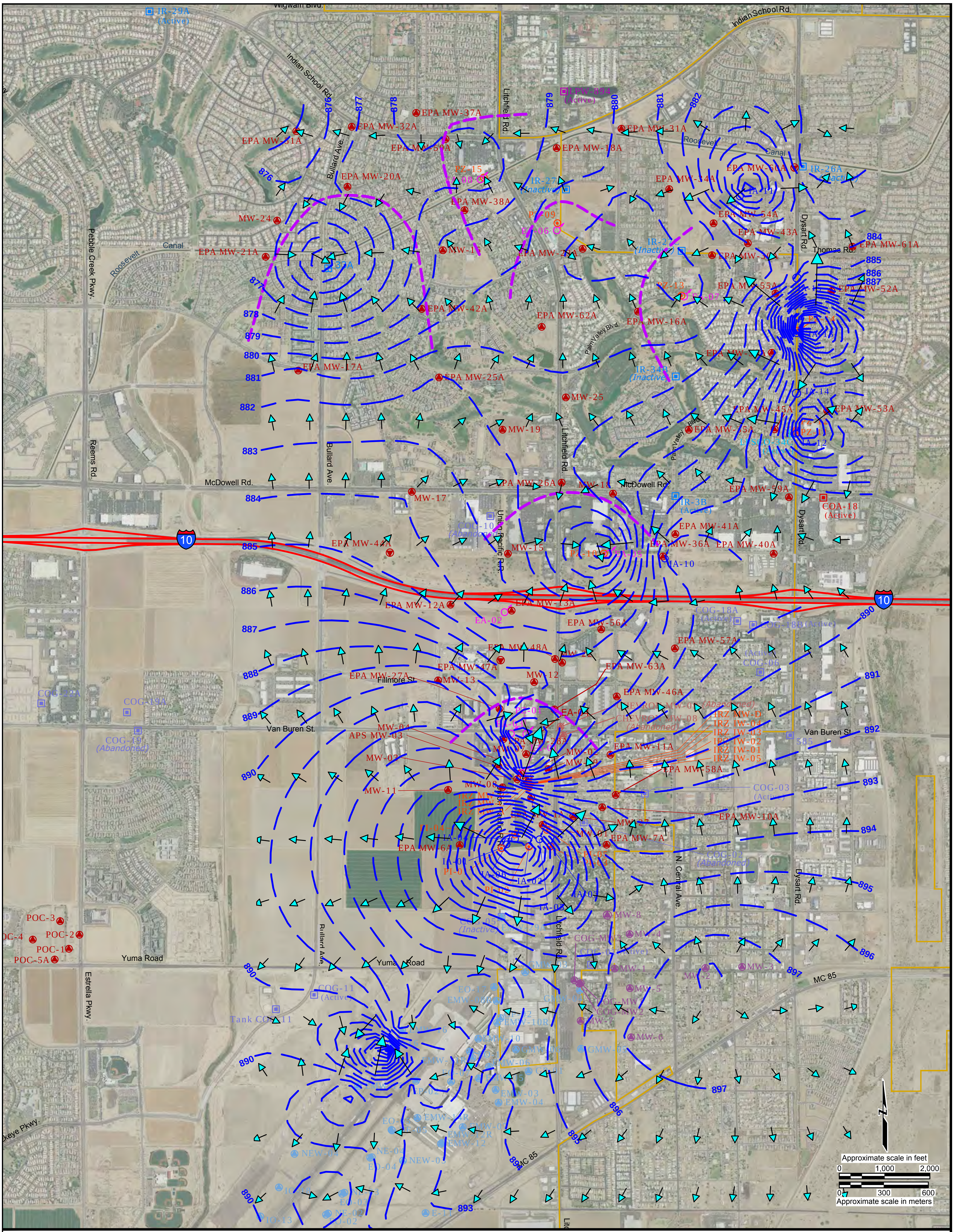
SITE LOCATION MAP WITH PERCHLORATE & TCE PLUME: SUBUNIT B, C, AND MAU

DRAWN BY:	DESIGNED BY:	APPROVED BY:	PROJECT NUMBER:
LM	HB	HB	13-100E-01
DATE: 3-21-2013	DATE: 3-21-2013	DATE: 3-21-2013	SCALE: 1" = 2000'

FIGURE NUMBER: 3



Explanation

EPA MW-55A	Subunit A monitor well
EA-07	Subunit A extraction well
EMW-29A	Subunit A monitor well - PGA - South site
COA MW1	Subunit A monitor well Western Ave. Plume site
PZ-13	Piezometer
IRZ IW-01	Injection well (IRZ)
IA-13	Injection well (treated water)
33A	UPI treatment system well
IR-3B	Irrigation well
COG-18A	City of Goodyear supply well
LPSCO-34C	Litchfield Park Services Co. production well
COA-02	City of Avondale supply well
TW-1	Algonquin water services well
PSDW	Park Shadows production well
LPW-894	City of Litchfield Park supply well
	Groundwater elevation in feet above mean sea level (MSL)
882	Potentiometric Isocontour showing groundwater elevation in feet above MSL; dashed where inferred
	Inferred Capture Zone
	Flow Vectors

EXTRACTION RATE SUMMARY
FEBRUARY 2013

WELL	PUMP RATE (gpm)
EA-01	80
EB-01	34
EA-02	19
EA-03	76
EC-01	115
MW-20	50
MW-29	71
PZ-01	87
33A	536
EA-05	400
EA-06	423
EA-07	297
EA-08	397

The extraction rate shown was the average rate based on readings from January 30, 2013 to February 27, 2013.

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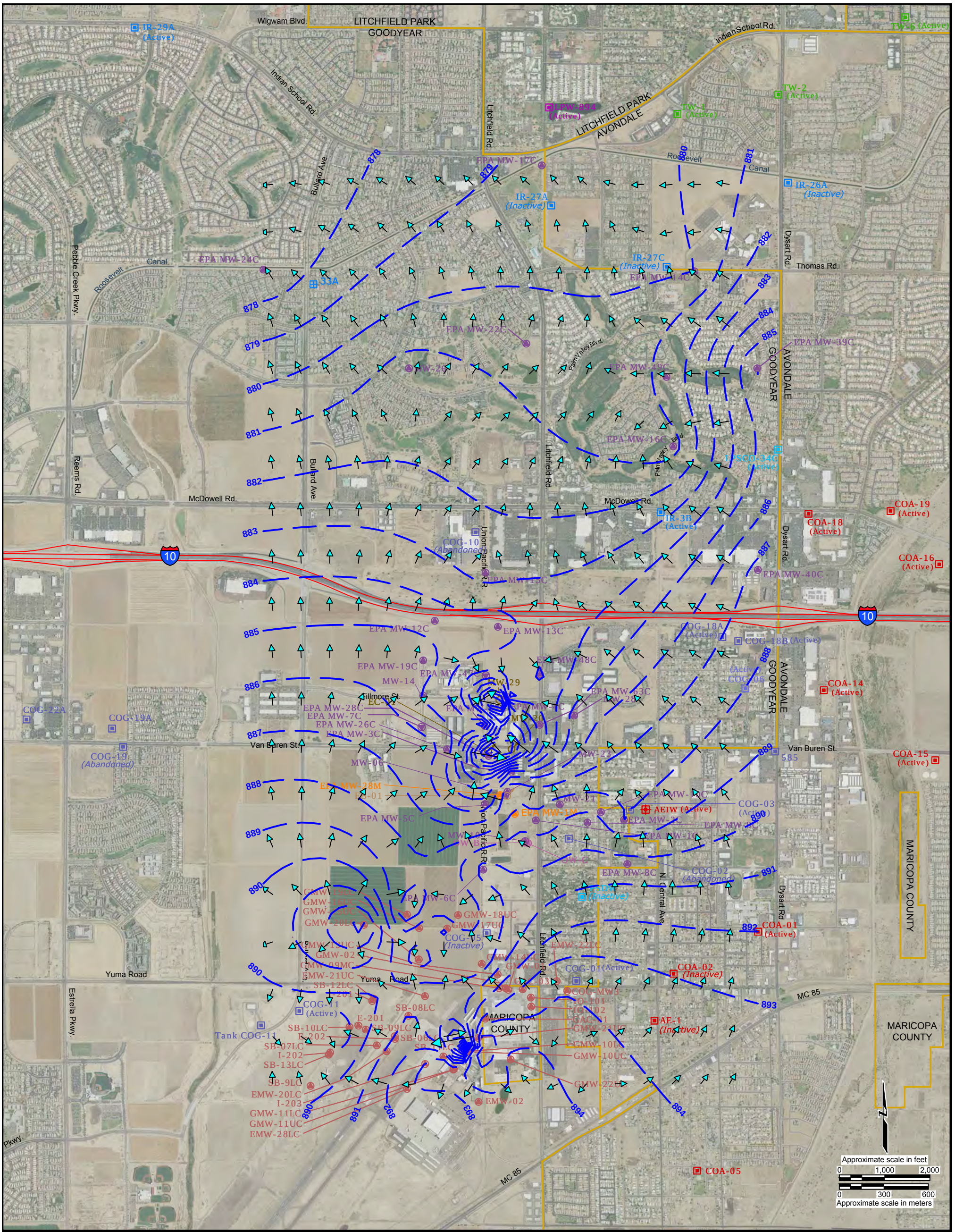
POTENTIOMETRIC SURFACE CONTOUR
SUBUNIT A, FEBRUARY 5-7, 2013

DRAWN BY:	DESIGNED BY:	APPROVED BY:	PROJECT NUMBER:
LM	HB	HB	13-100E-01
DATE: 3-21-2013	DATE: 3-21-2013	DATE: 3-21-2013	SCALE: 1"=2000'

FIGURE NUMBER: 4



Explanation

- 33A — UPI treatment system well
- IR-3B — Irrigation well
- COG-18A — City of Goodyear supply well
- LPW-894 — City of Litchfield Park supply well
- LPSCO-34C — Litchfield Park Services Co. production well
- EPA MW-48C — Subunit C monitor well
- EPA MW-28M — MAU monitor well
- EB-01 — Subunit B extraction well
- EC-01 — Subunit C extraction well
- COG-MW3 — Subunit C monitor well - PGA - South site
- OW-B — Observation well
- COA-02 — City of Avondale supply well
- AEIW — Avondale Elementary irrigation well
- TW-1 — Algonquin water services well
- PSDW — Park Shadows production well
- 882 — Potentiometric Isocontour showing groundwater elevation in feet above MSL; dashed where inferred
- Flow Vectors

EXTRACTION RATE SUMMARY FEBRUARY 2013

WELL	PUMP RATE (gpm)
EA-01	80
EB-01	34
EA-02	19
EA-03	76
EC-01	115
MW-20	50
MW-29	71
PZ-01	87
33A	536
EA-05	400
EA-06	423
EA-07	297
EA-08	397

The extraction rate shown was the average rate based on readings from January 30, 2013 to February 27, 2013.

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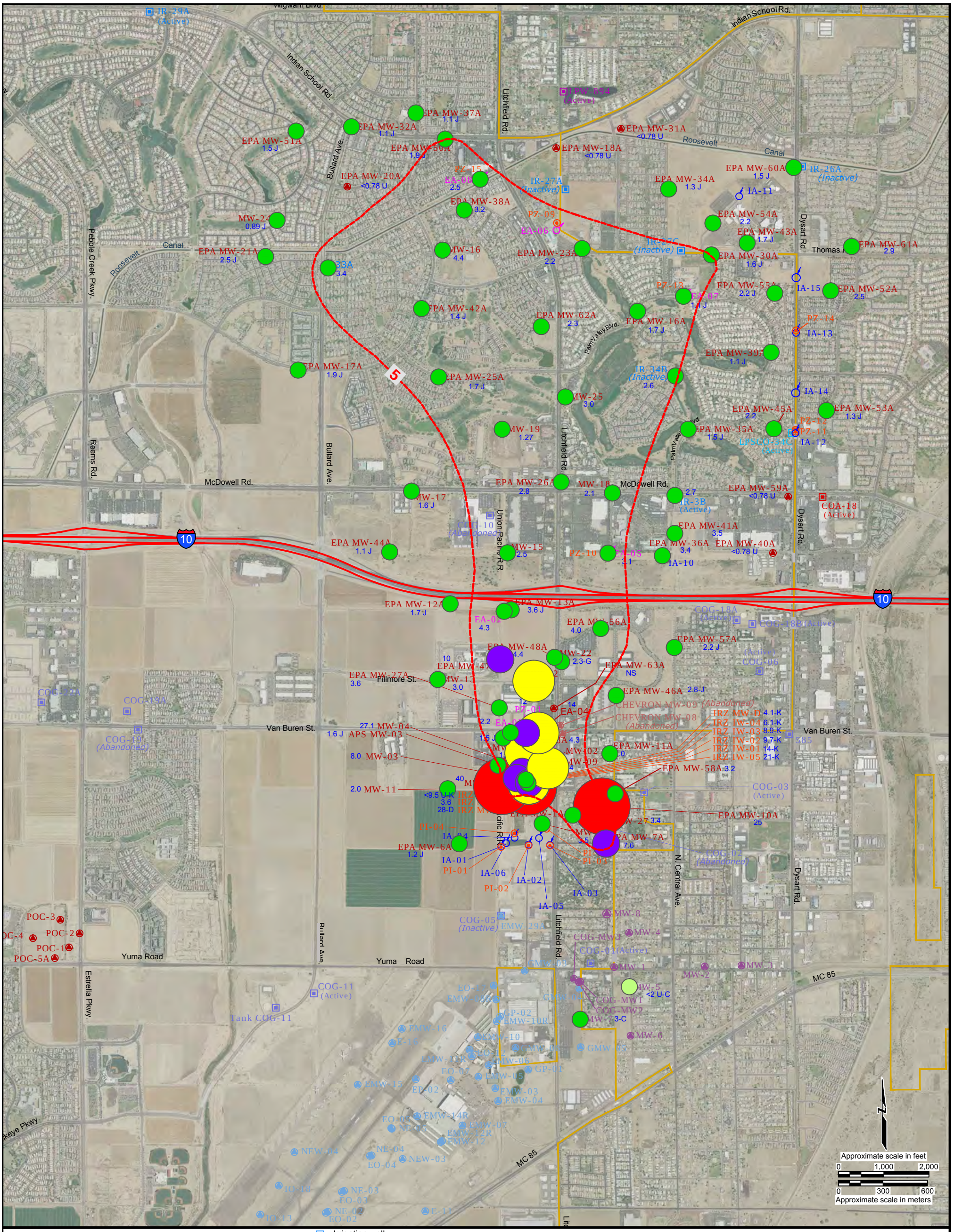
POTENTIOMETRIC SURFACE CONTOUR, SUBUNIT C, FEBRUARY 5-7, 2013

DRAWN BY:	DESIGNED BY:	APPROVED BY:	PROJECT NUMBER:
LM	HB	HB	13-100E-01
DATE: 2-19-2013	DATE: 2-19-2013	DATE: 2-19-2013	SCALE: 1" = 2000'

FIGURE NUMBER: 5



Explanation

EPA MW-55A	Subunit A monitor well
EA-07	Subunit A extraction well
EMW-29A	Subunit A monitor well - PGA - South site
COA MW1	Subunit A monitor well Western Ave. Plume site
PZ-13	Piezometer
IRZ IW-01	Injection well (IRZ)
IA-13	Injection well (treated water)
33A	UPI treatment system well

IR-3B	Irrigation well
COG-18A	City of Goodyear supply well
LPSCO-34C	Litchfield Park Services Co. production well
COA-02	City of Avondale supply well
TW-1	Algonquin water services well
PSDW	Park Shadows production well
LPW-894	City of Litchfield Park supply well
1.6	Perchlorate Concentration ug/L (February 2013)-unless noted otherwise
5	Isocontour showing February 2013 TCE concentration in µg/L. Dashed where inferred.

DATE IDENTIFIER

A - MARCH 2003	G - NOVEMBER 2010
B - NOVEMBER 2004	H - DECEMBER 2010
C - DECEMBER 2004	I - MAY 2011
D - APRIL 2008	J - AUGUST 2011
E - MARCH 2010	K - NOVEMBER 2011
F - AUGUST 2010	L - NOVEMBER 2012

PERCHLORATE CONCENTRATION

- Not Detected with MDL 2 or 4 ug/L
- 0.54-6 ug/L
- 7-13 ug/L
- 14-20 ug/L
- >20 ug/L

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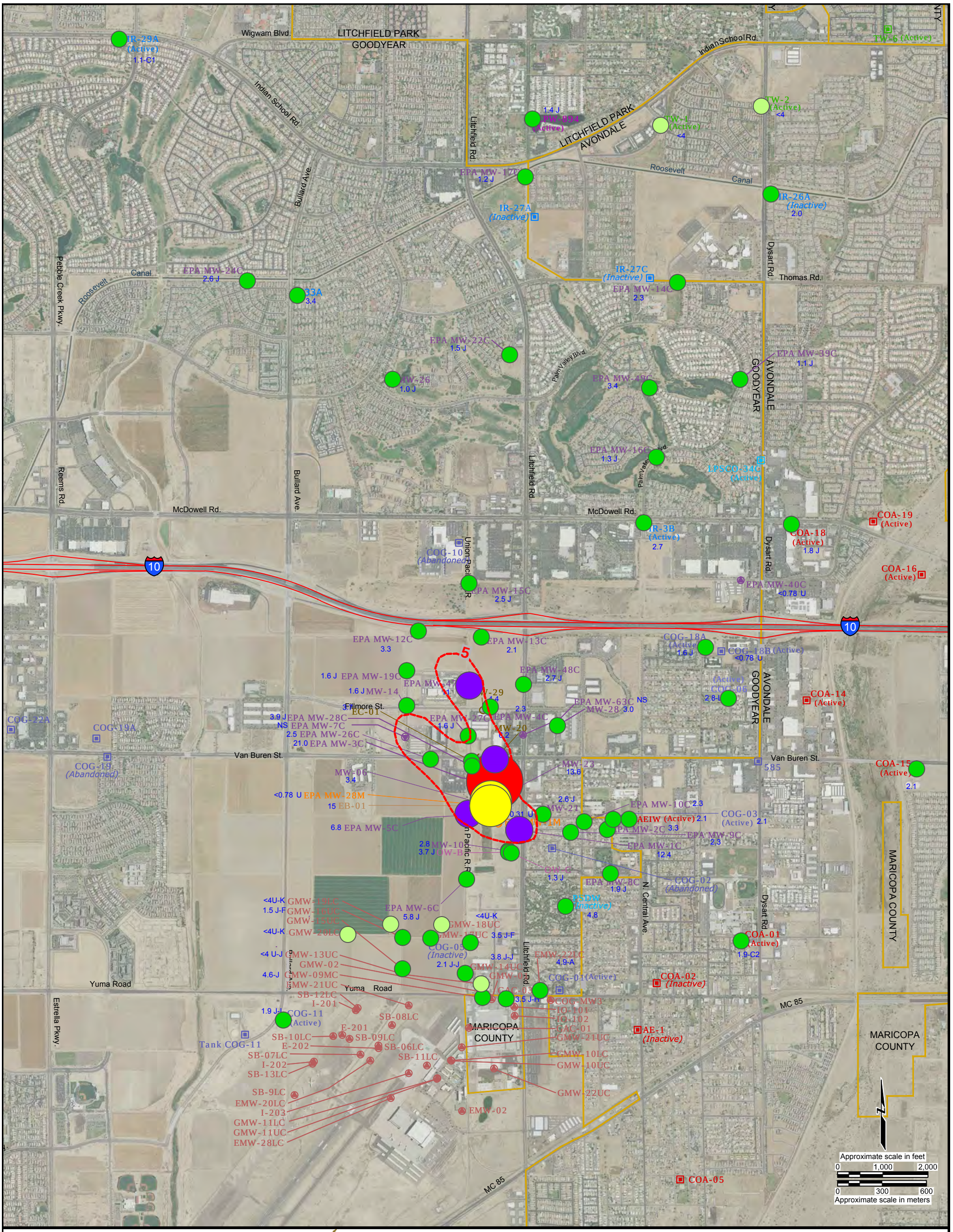
PERCHLORATE DISTRIBUTION
SUBUNIT A

DRAWN BY:	DESIGNED BY:	APPROVED BY:	PROJECT NUMBER:
LM	HB	HB	13-100E-01
DATE: 3-21-2013	DATE: 3-21-2013	DATE: 3-21-2013	SCALE: 1"=2000'

FIGURE NUMBER: 6



Explanation

- 33A — UPI treatment system well
- IR-3B — Irrigation well
- COG-18A — City of Goodyear supply well
- LPW-894 — City of Litchfield Park supply well
- LPSCO-34C — Litchfield Park Services Co. production well
- EPA MW-48C — Subunit C monitor well
- EPA MW-28M — MAU monitor well
- EB-01 — Subunit B extraction well
- EC-01 — Subunit C extraction well
- COG-MW3 — Subunit C monitor well - PGA - South site
- OW-B — Observation well
- COA-02 — City of Avondale supply well
- AEIW — Avondale Elementary irrigation well
- TW-1 — Algonquin water services well
- PSDW — Park Shadows production well
- 5.8 J — Perchlorate Concentration ug/L (February 2013)-unless noted otherwise
- 5 — Isocontour showing February 2013 TCE concentration in µg/L. Dashed where inferred.

DATE IDENTIFIER

A - MARCH 2003	F - AUGUST 2010
B - NOVEMBER 2004	G - NOVEMBER 2010
C - DECEMBER 2004	H - DECEMBER 2010
C1 - MAY 2007	I - MAY 2011
C2 - AUGUST 2007	J - AUGUST 2011
D - APRIL 2008	K - NOVEMBER 2011
E - MARCH 2010	L - NOVEMBER 2012

PERCHLORATE CONCENTRATION

- Not Detected with MDL 2 or 4 ug/L
- 0.54-6 ug/L
- 7-13 ug/L
- 14-20 ug/L
- >20 ug/L

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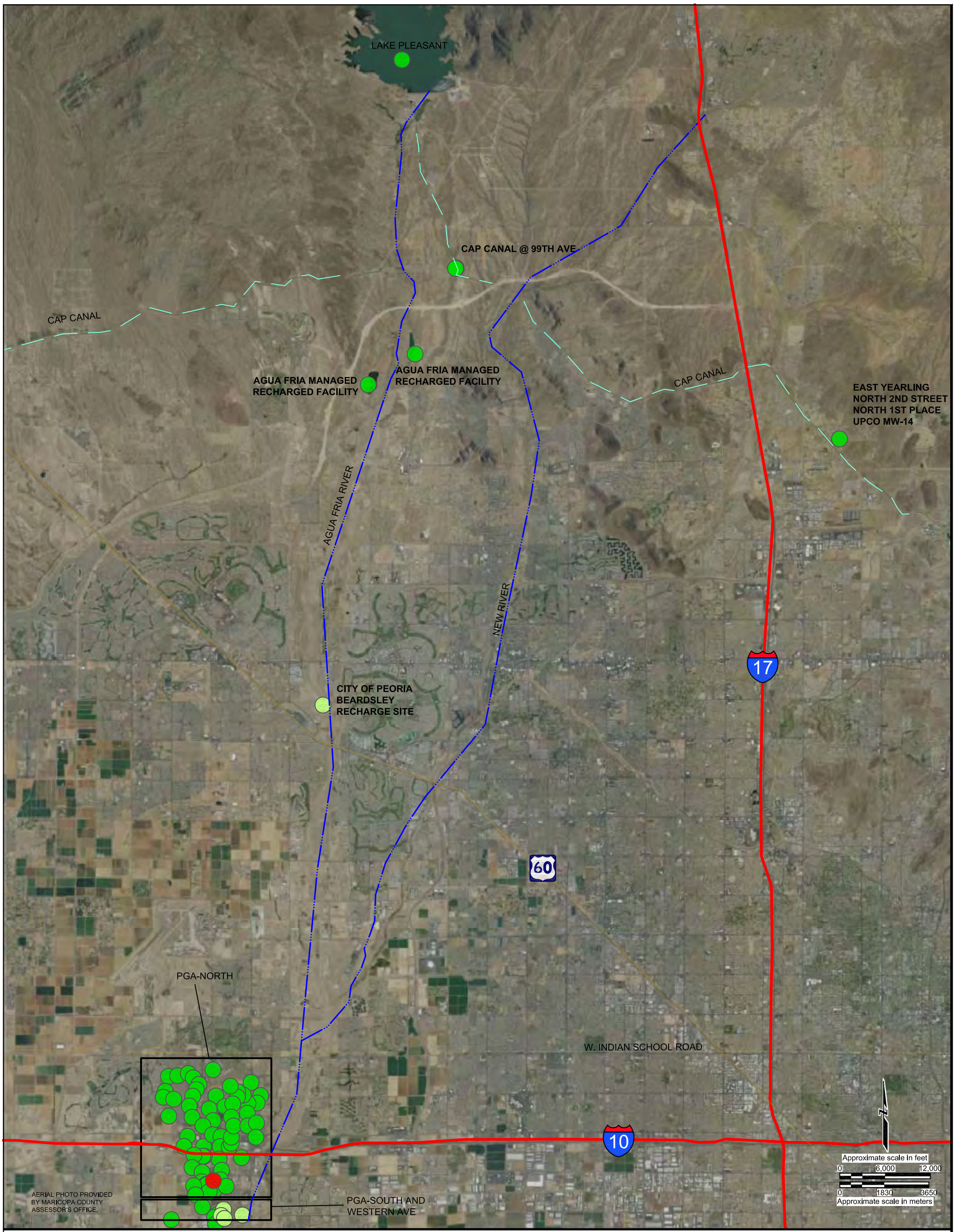
PERCHLORATE DISTRIBUTION
SUBUNIT B, C, AND MAU

DRAWN BY:	DESIGNED BY:	APPROVED BY:	PROJECT NUMBER:
LM	HB	HB	13-100E-01
DATE: 3-21-2013	DATE: 3-21-2013	DATE: 3-21-2013	SCALE: 1" = 2000'

FIGURE NUMBER: 7



LEGEND

- River
- CAP Canal

PERCHLORATE CONCENTRATION

- Not Detected with MDL 2 or 4 ug/L
- 0.54-6 ug/L
- >20 ug/L

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PERCHLORATE DISTRIBUTION,
PGA-NORTH & 2004 ADEQ SAMPLES

DRAWN BY:	DESIGNED BY:	APPROVED BY:	PROJECT NUMBER:
LM	HB	HB	13-100E-01
DATE:	DATE:	DATE:	SCALE:
3-21-2013	3-21-2013	3-21-2013	1"=2000'

FIGURE NUMBER:
8

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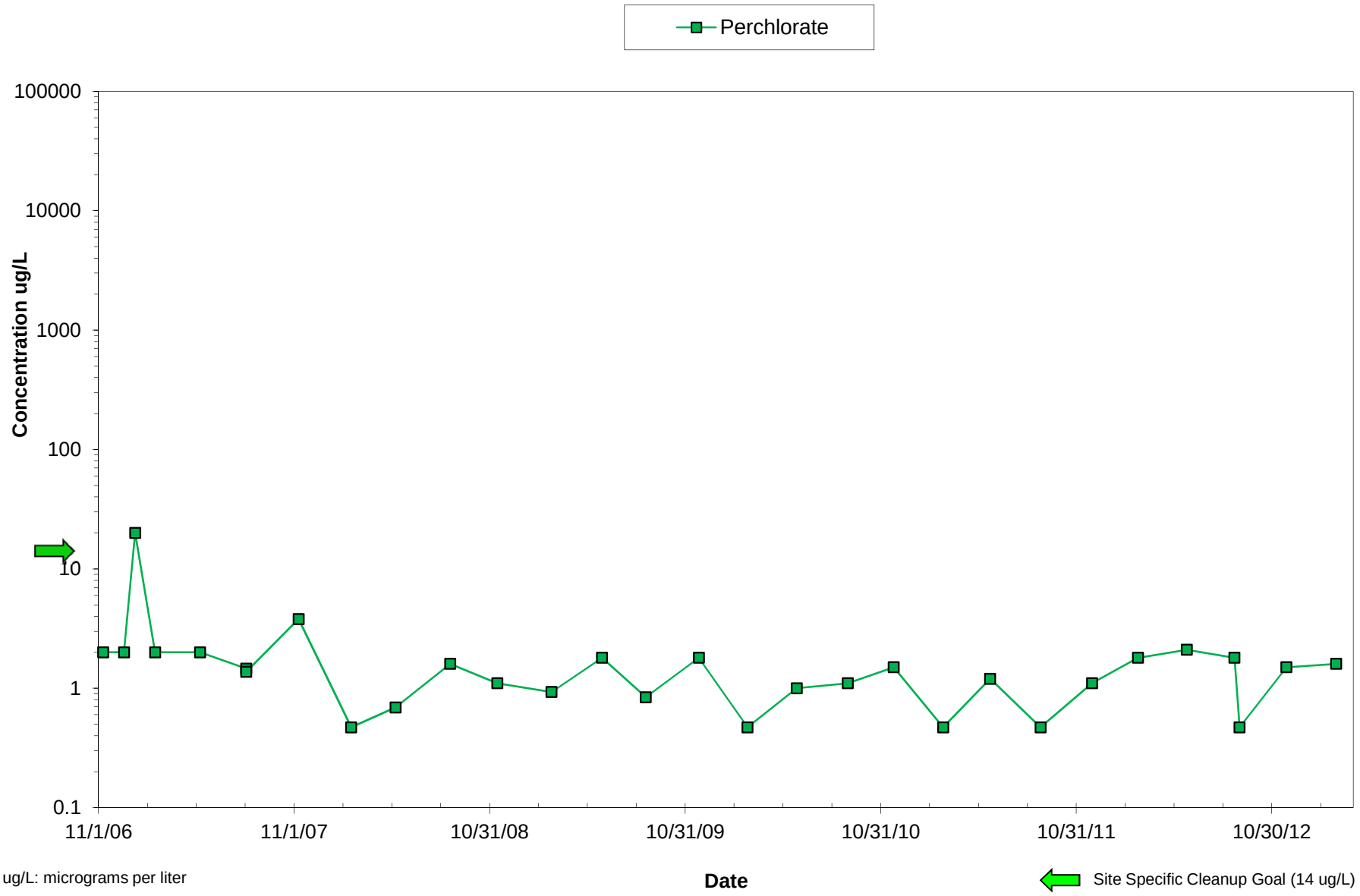
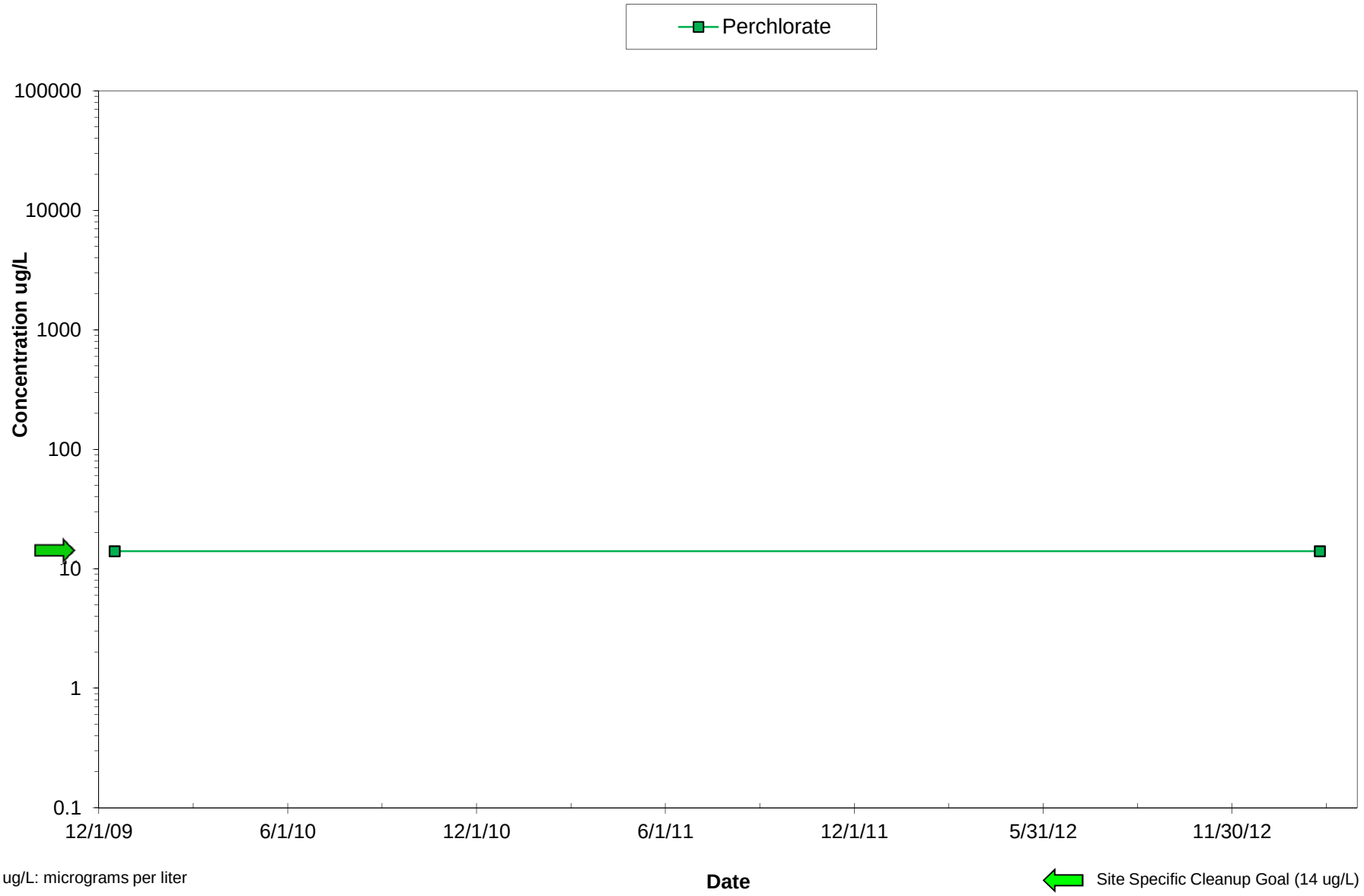
APS MW-03
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

EA-04
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

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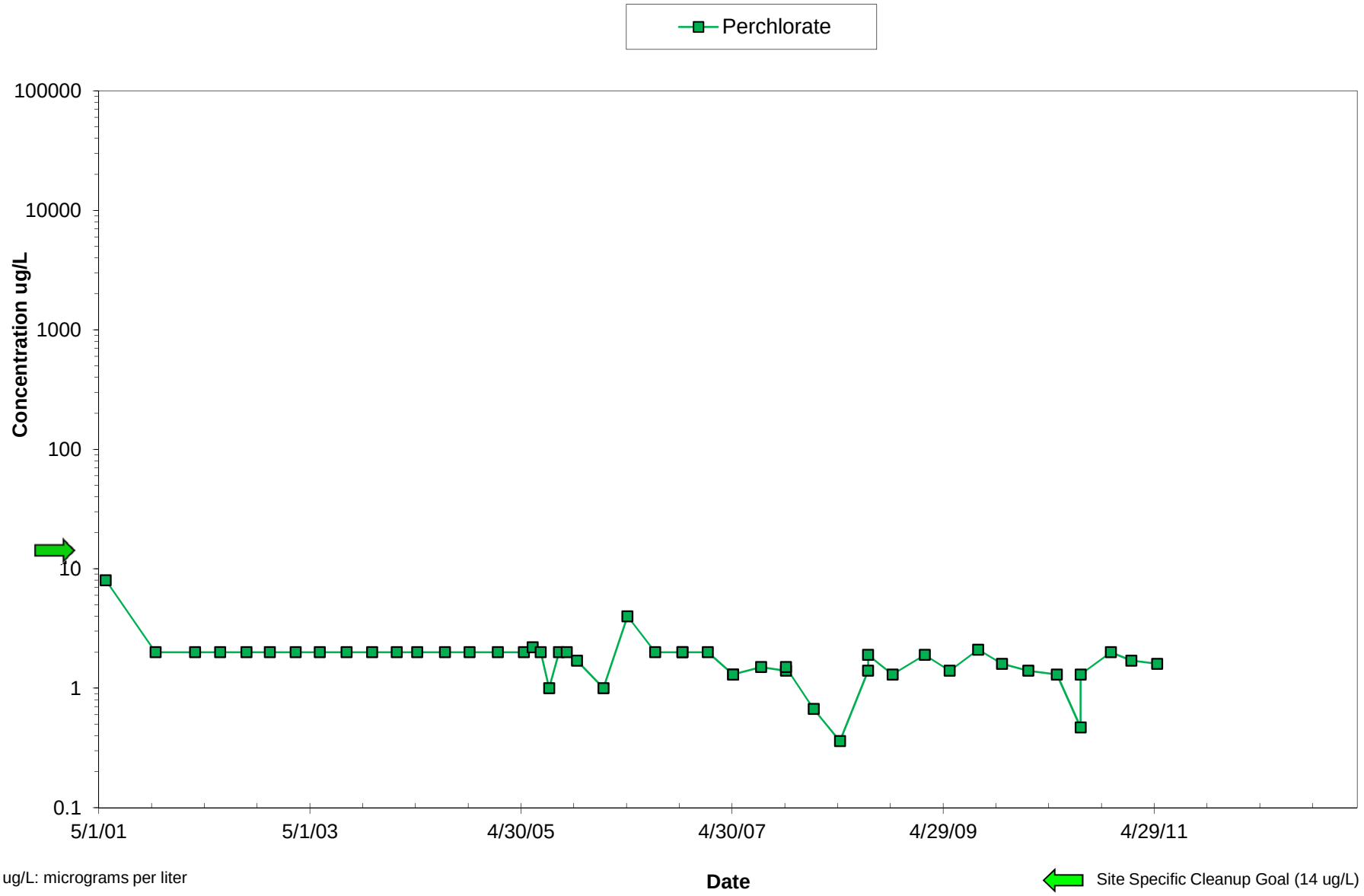
EMW-29A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

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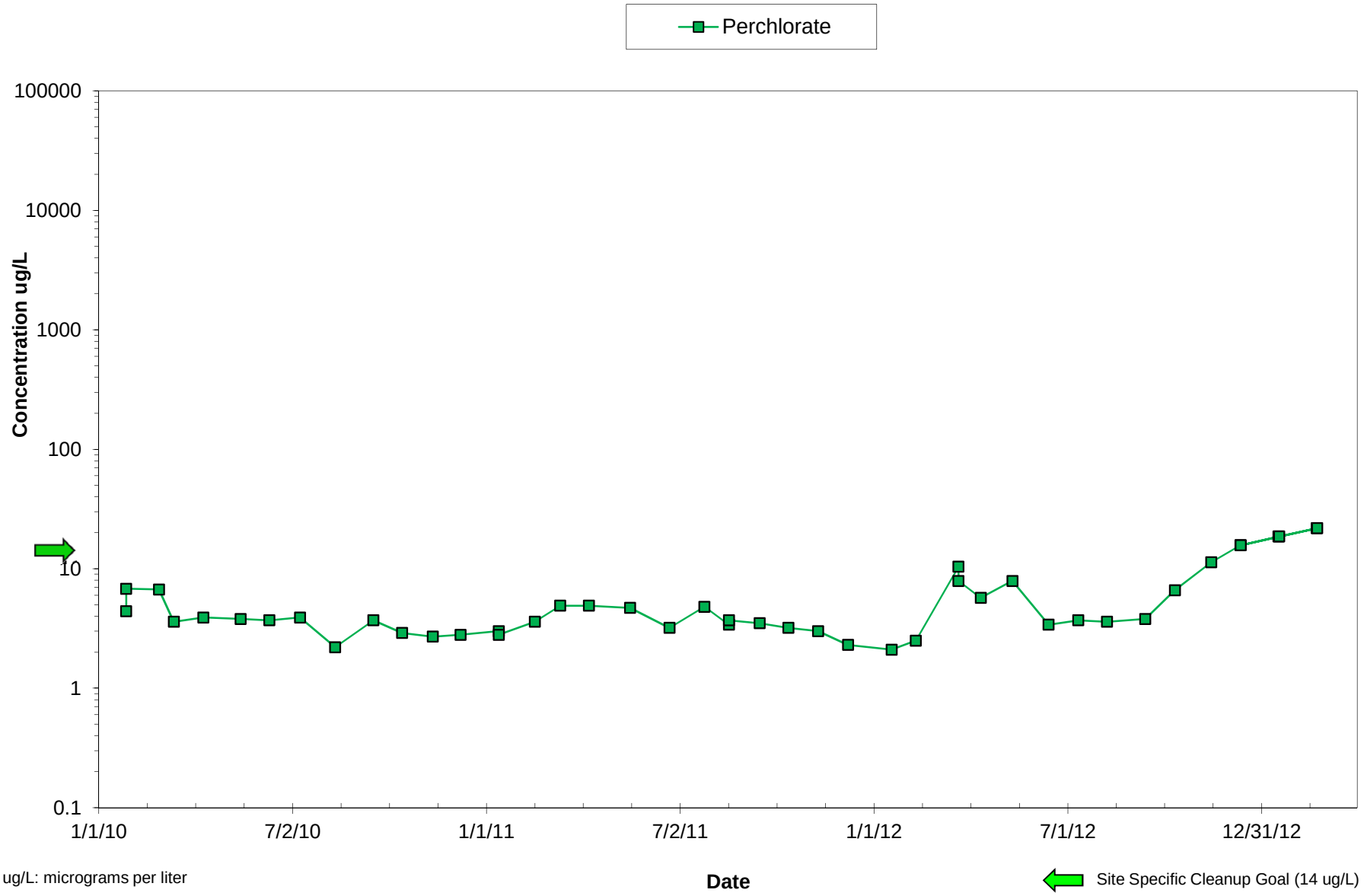
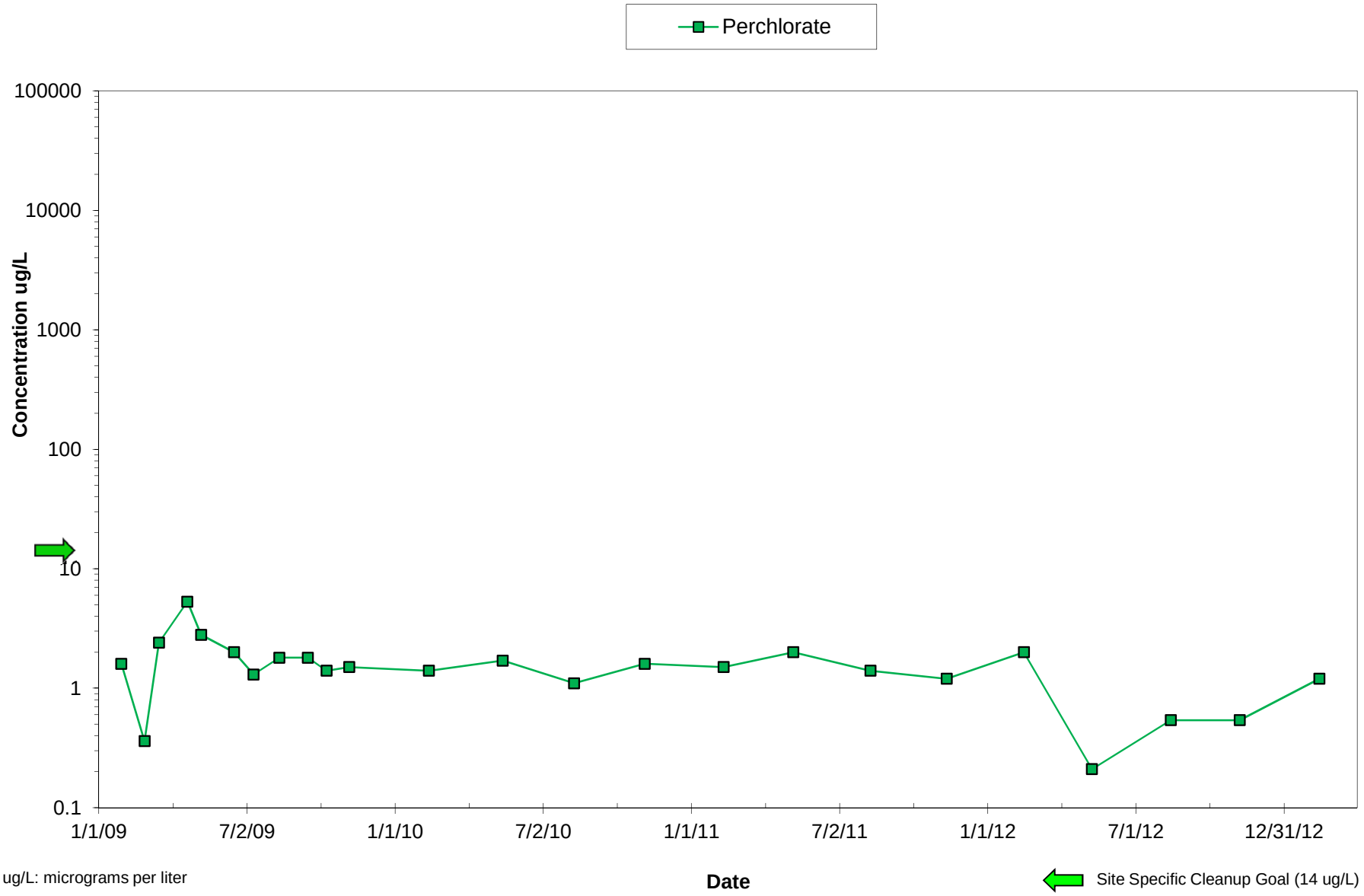
EPA MW-1A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

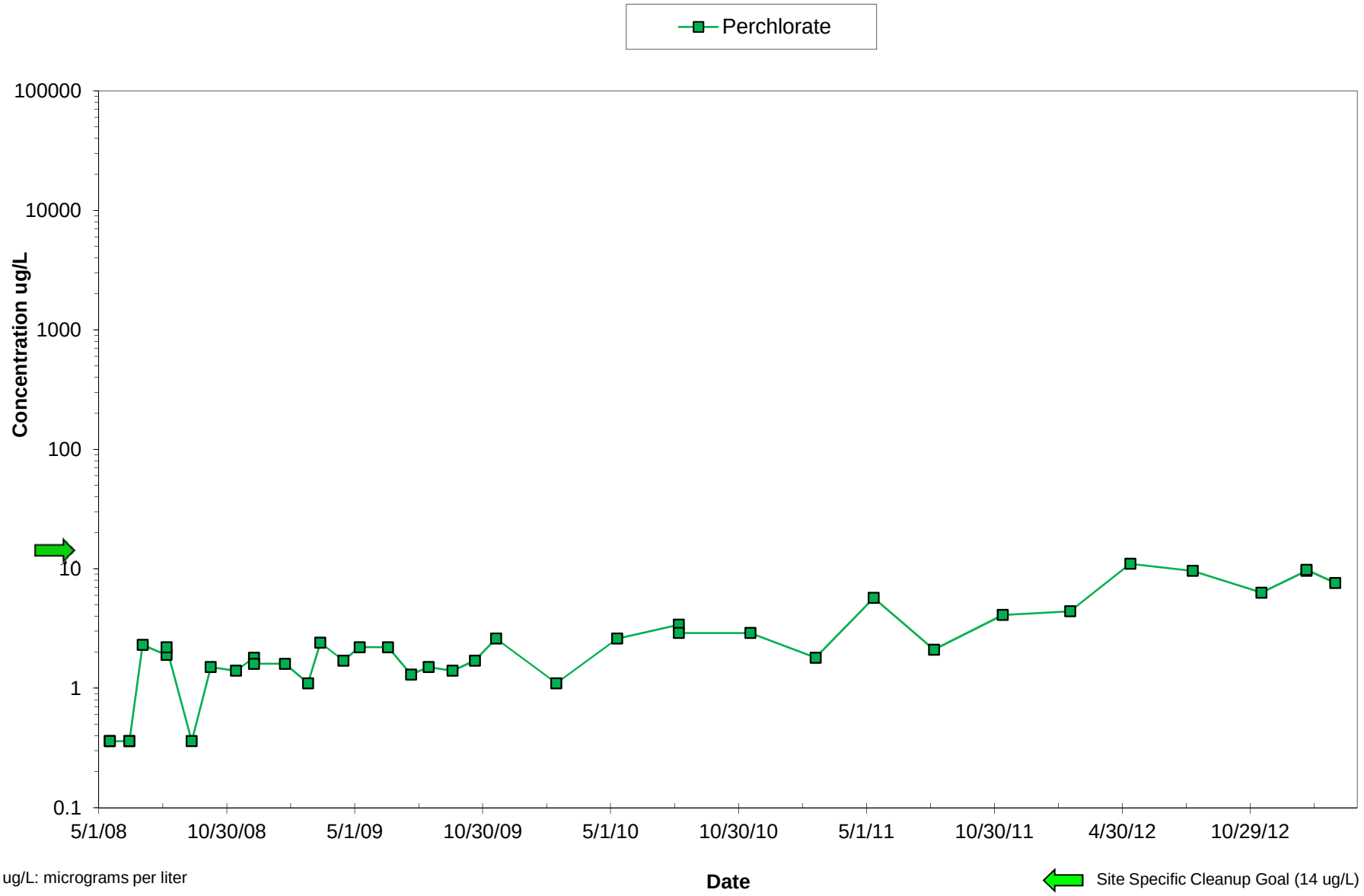
EPA MW-6A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

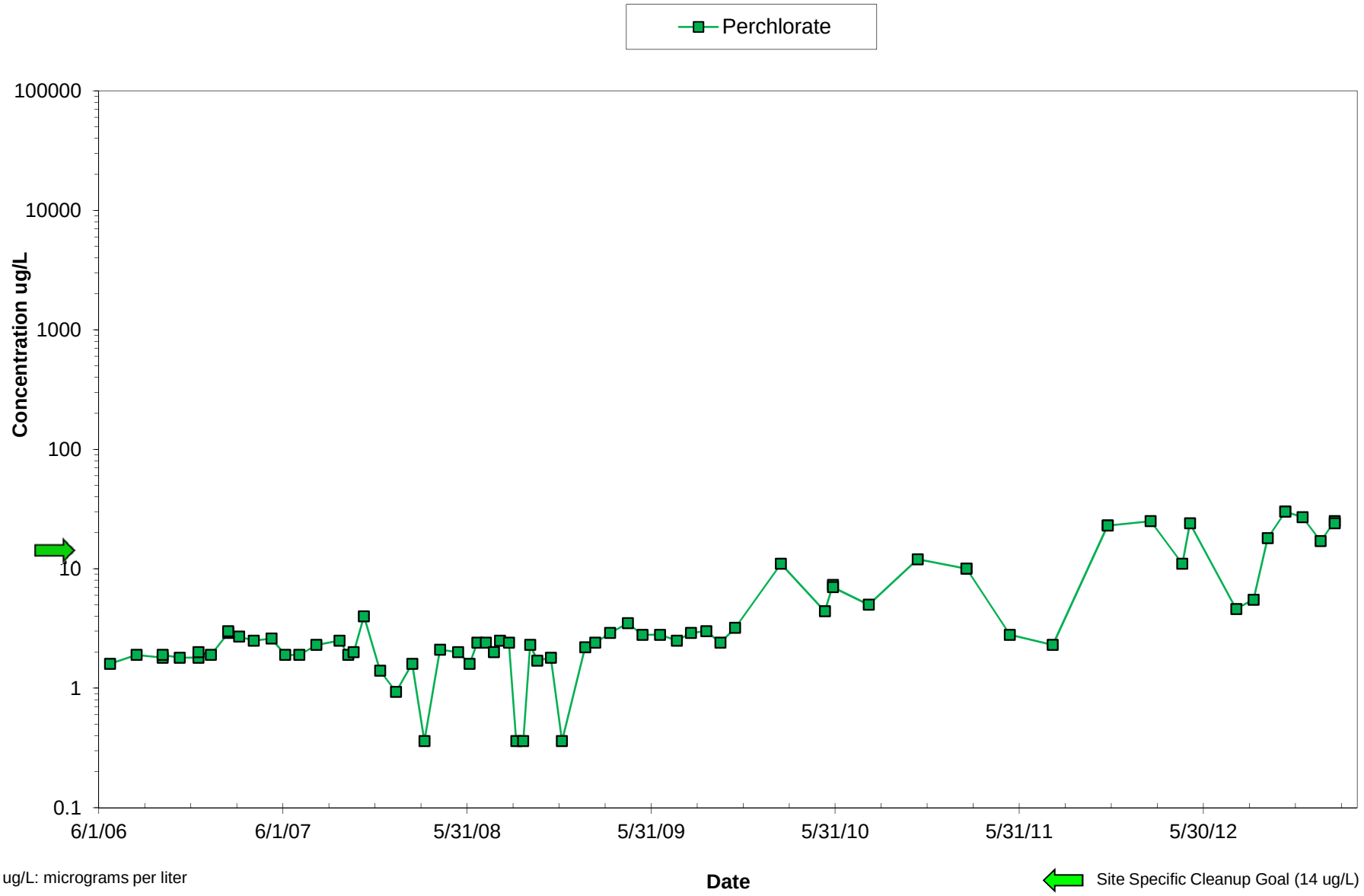
EPA MW-7A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

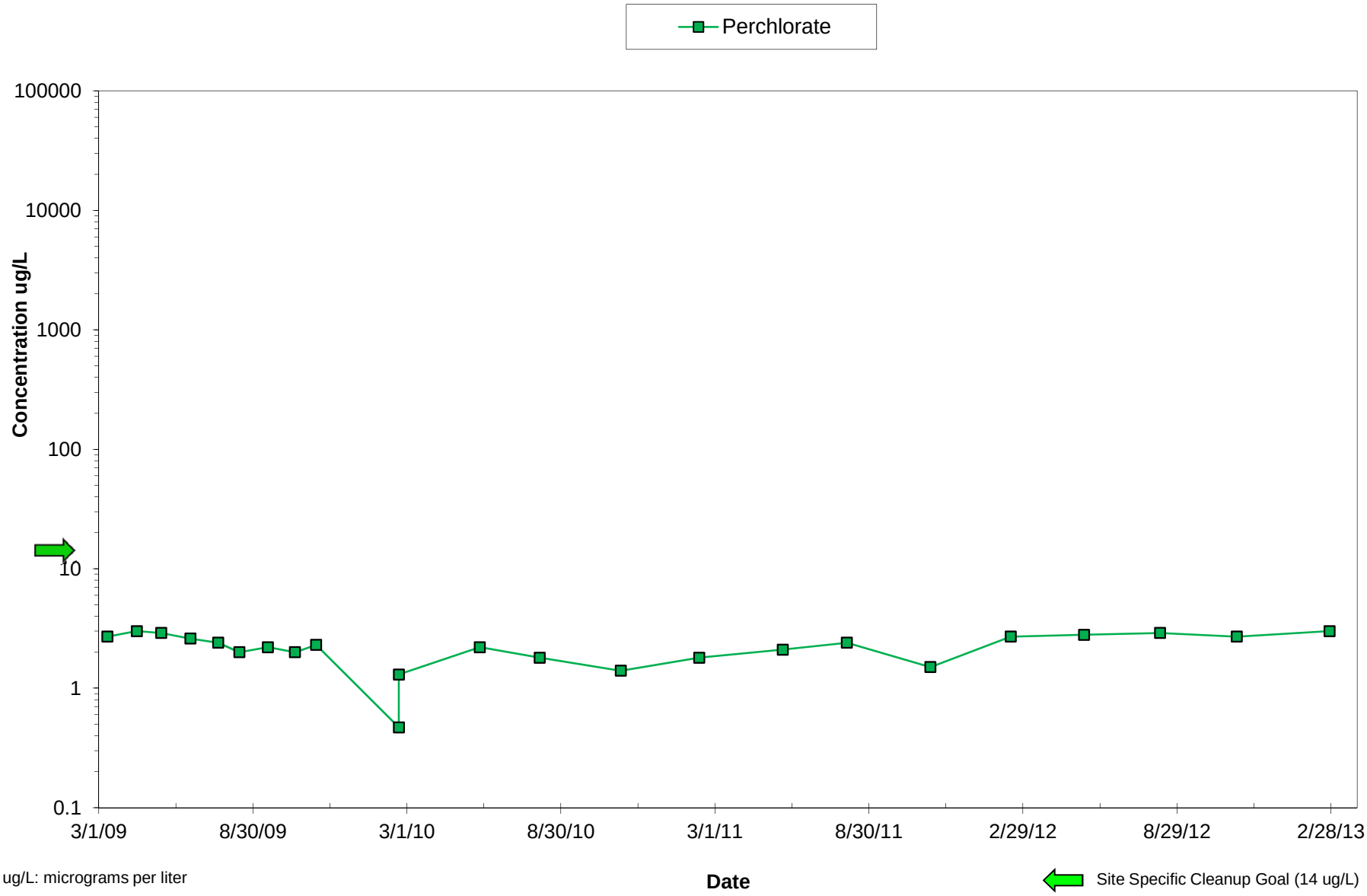
EPA MW-10A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

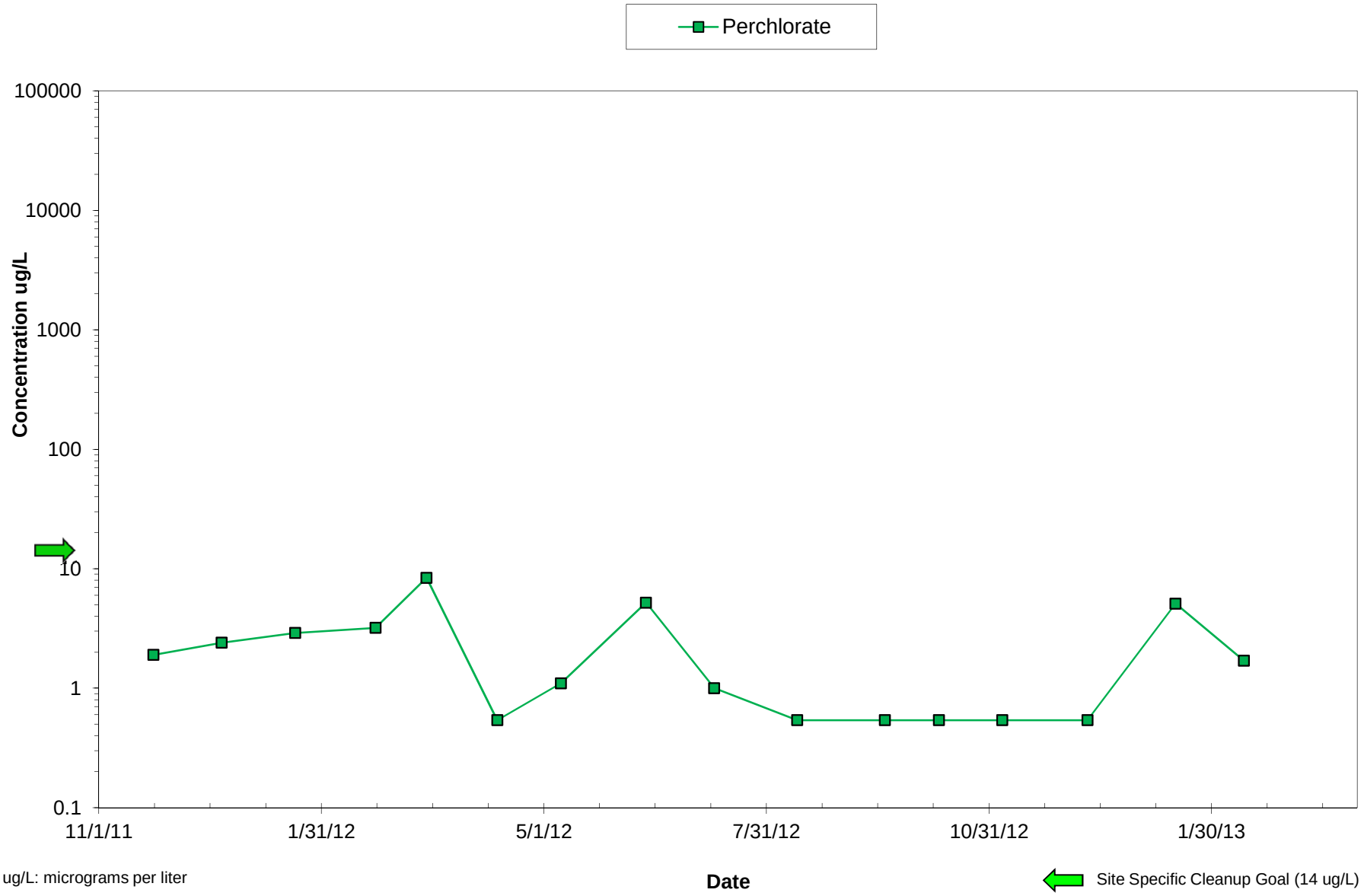
EPA MW-11A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

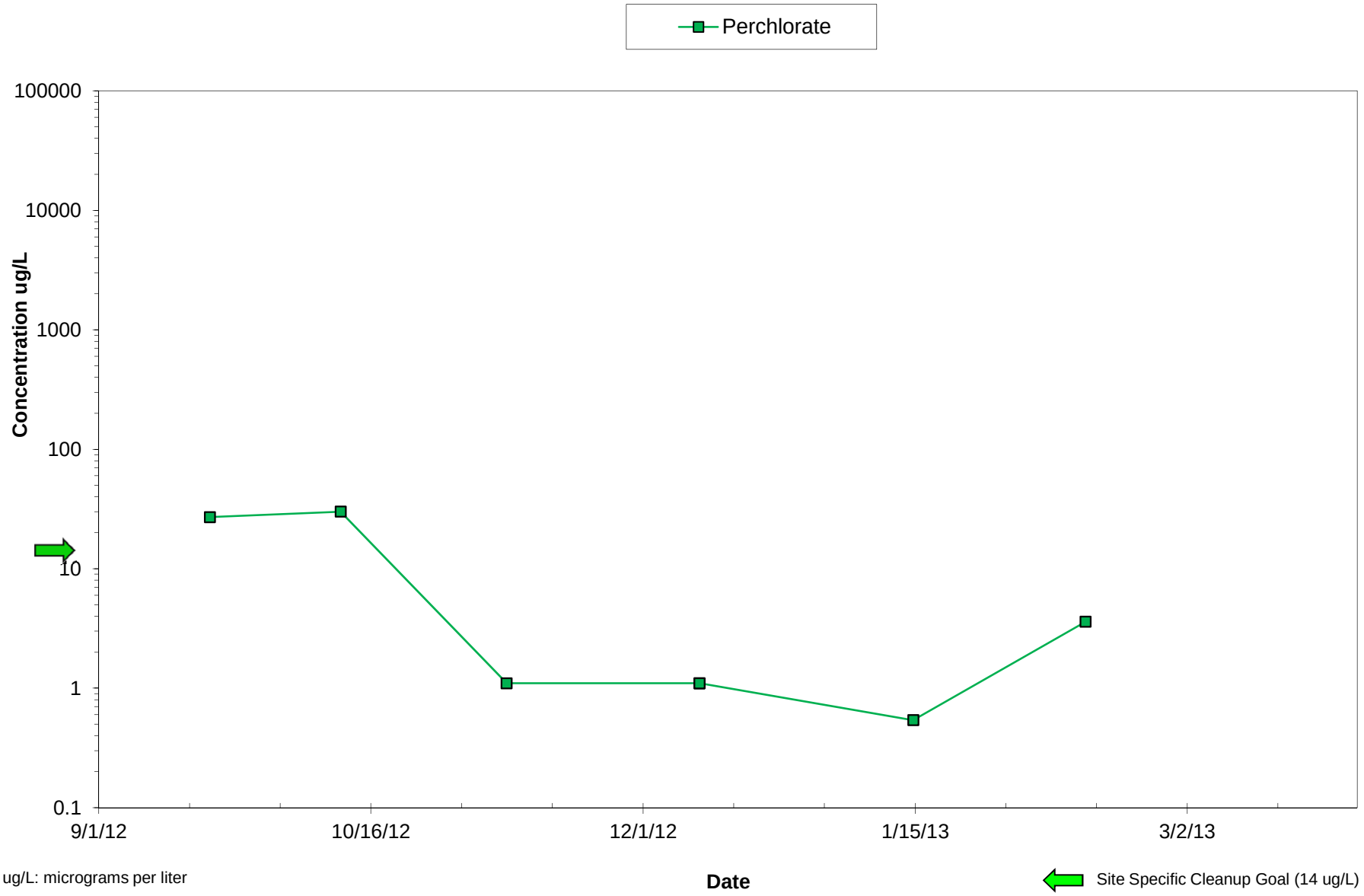
EPA MW-12A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

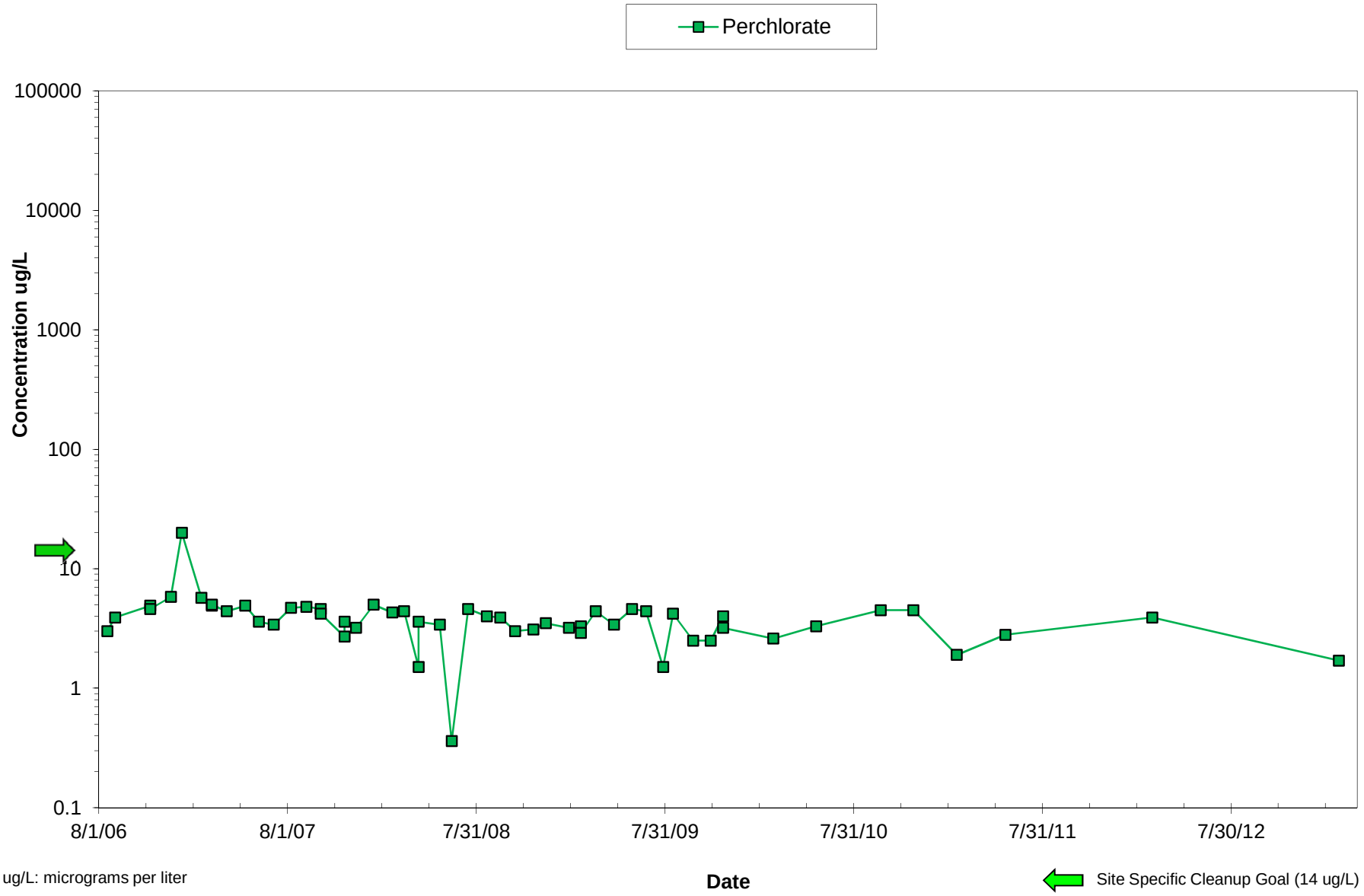
EPA MW-13A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

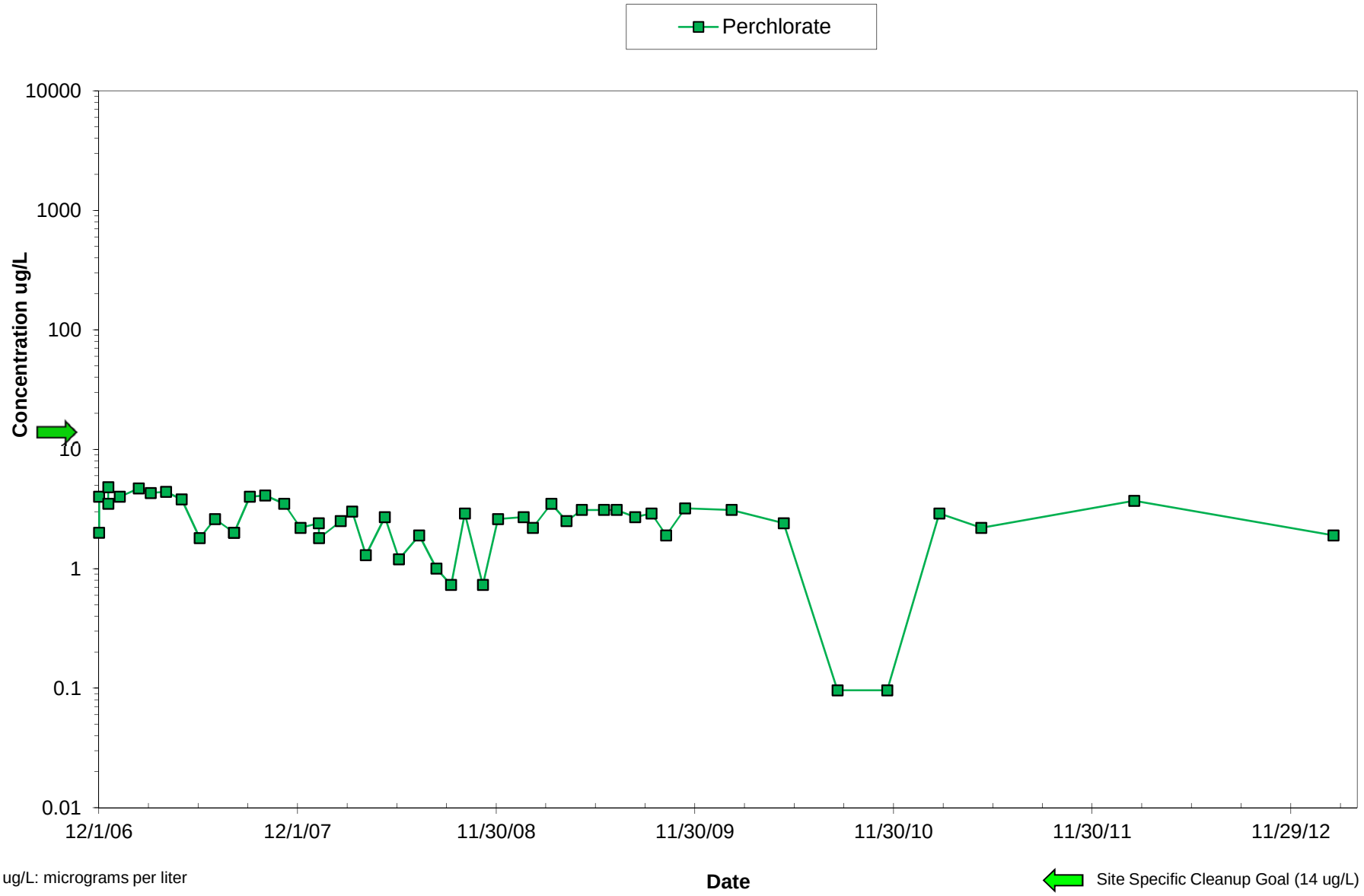
EPA MW-16A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

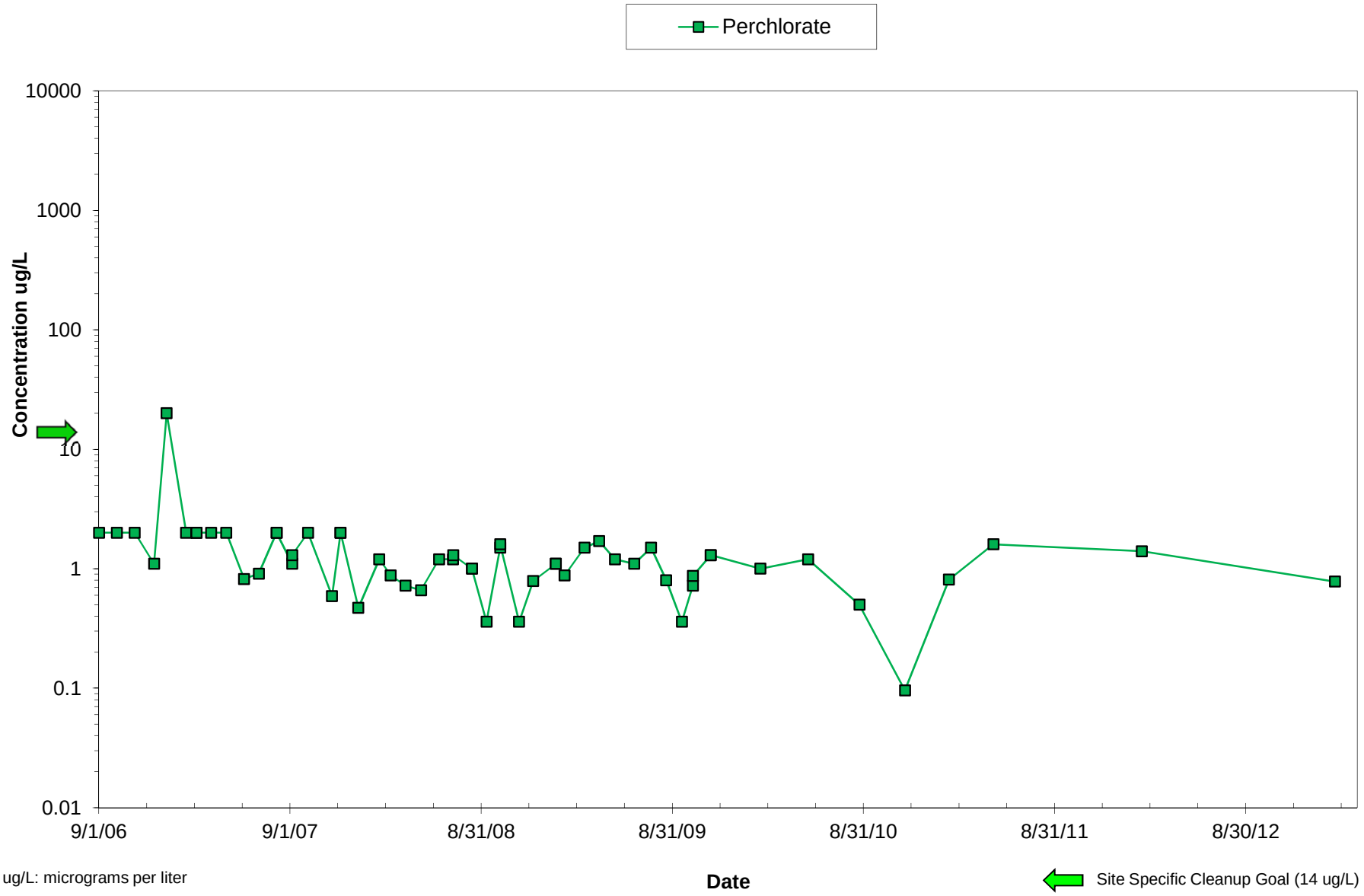
EPA MW-17A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

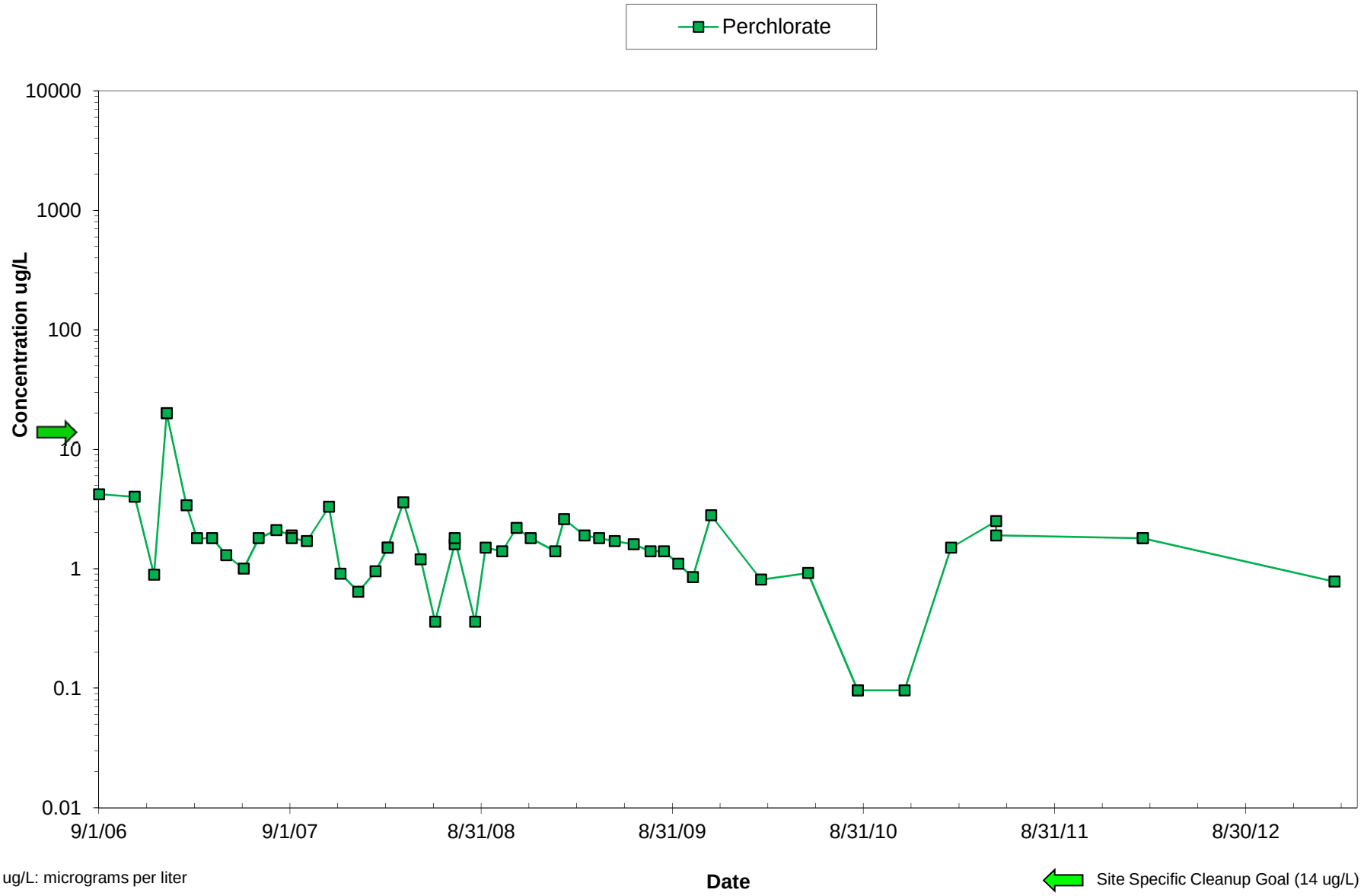
EPA MW-18A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

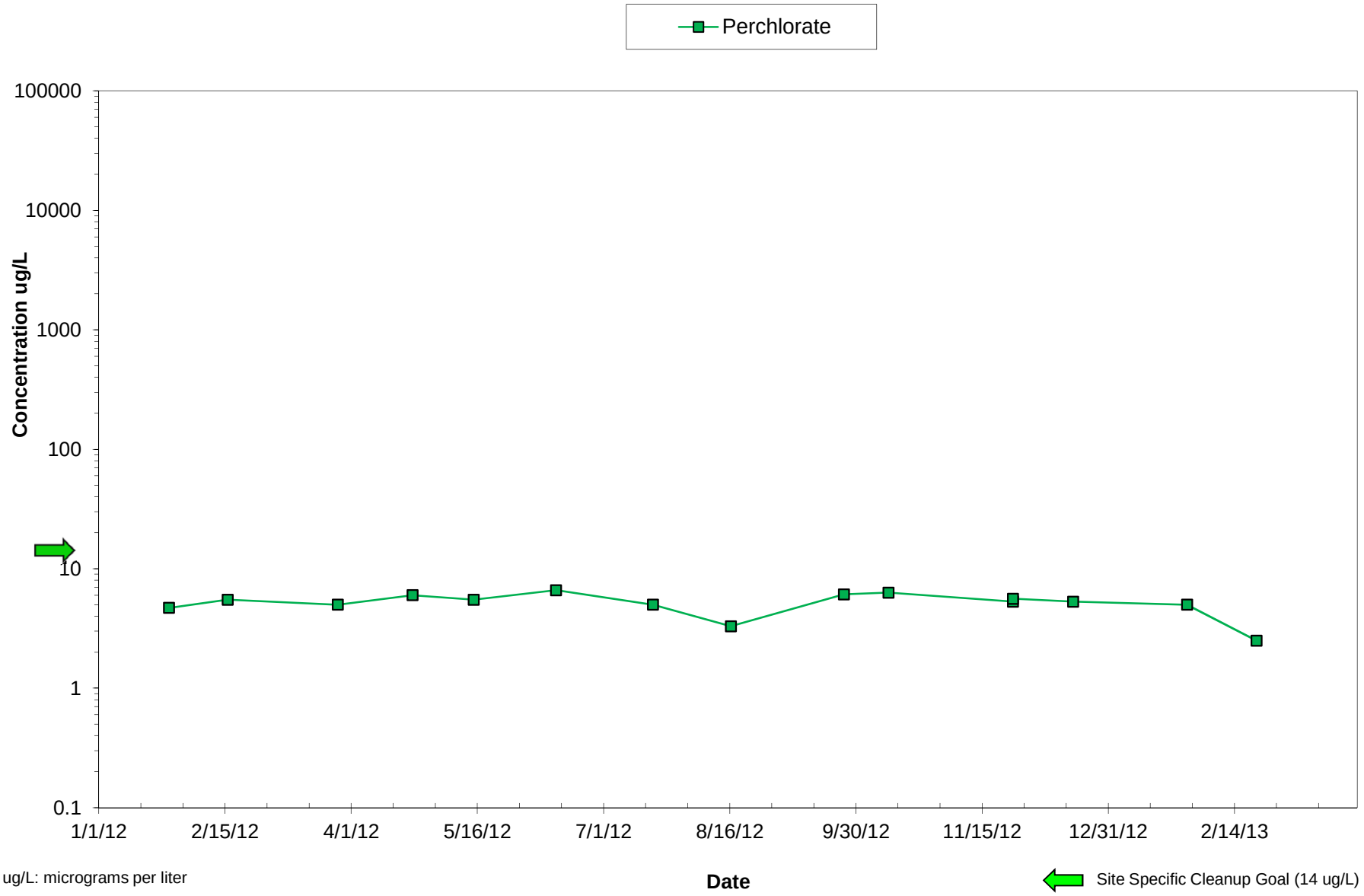
EPA MW-20A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

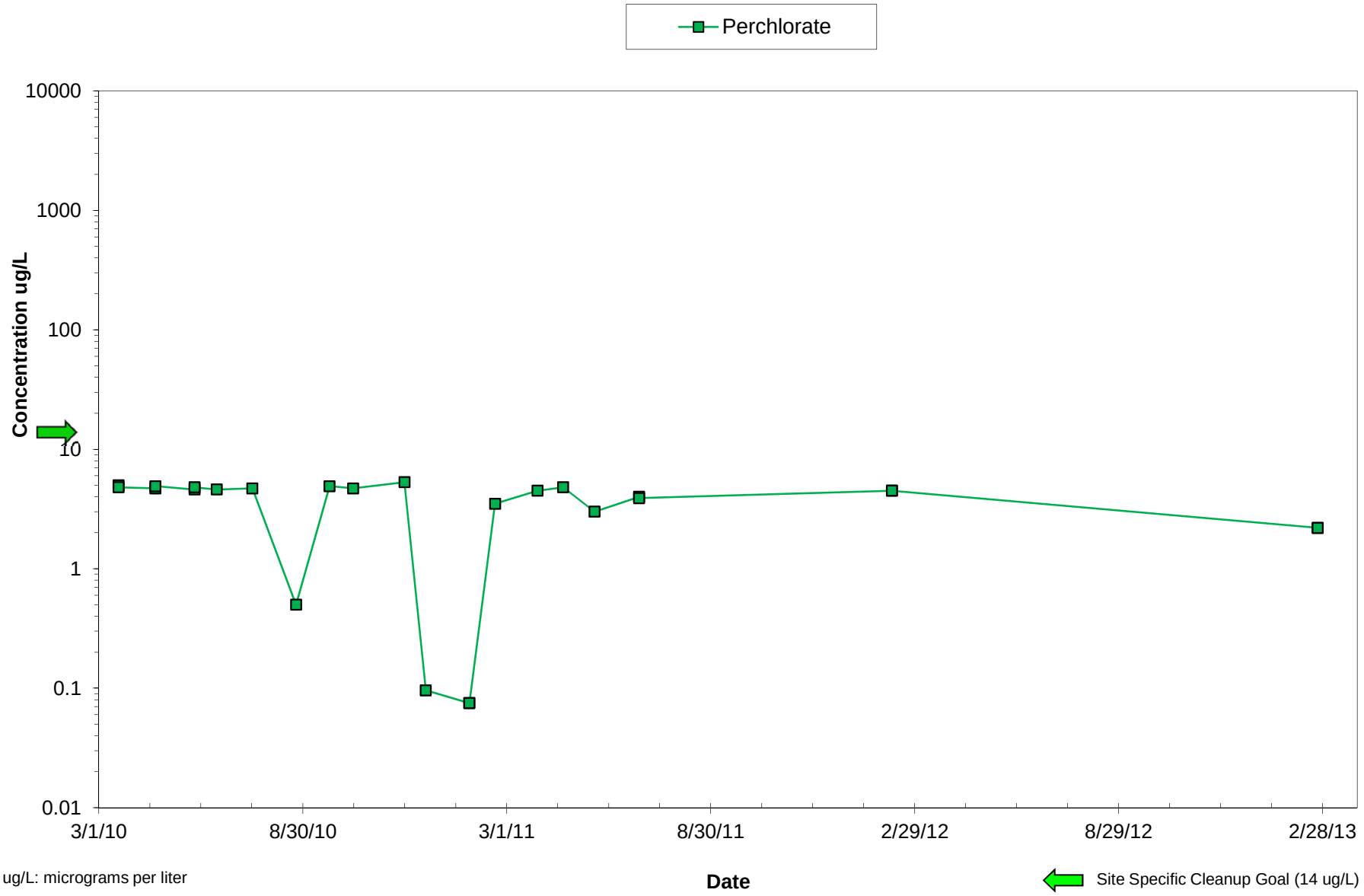
EPA MW-21A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

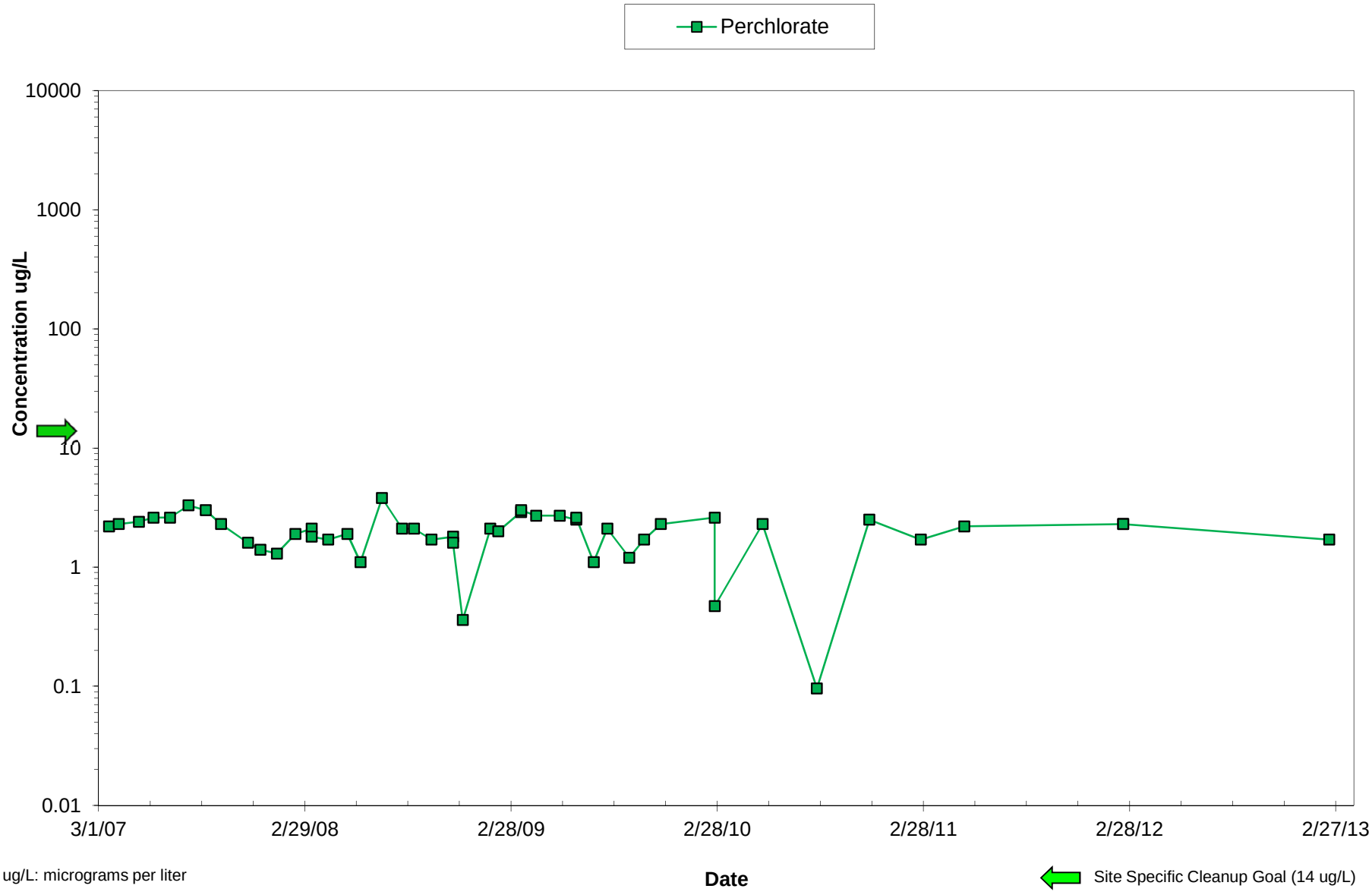
EPA MW-23A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

EPA MW-25A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

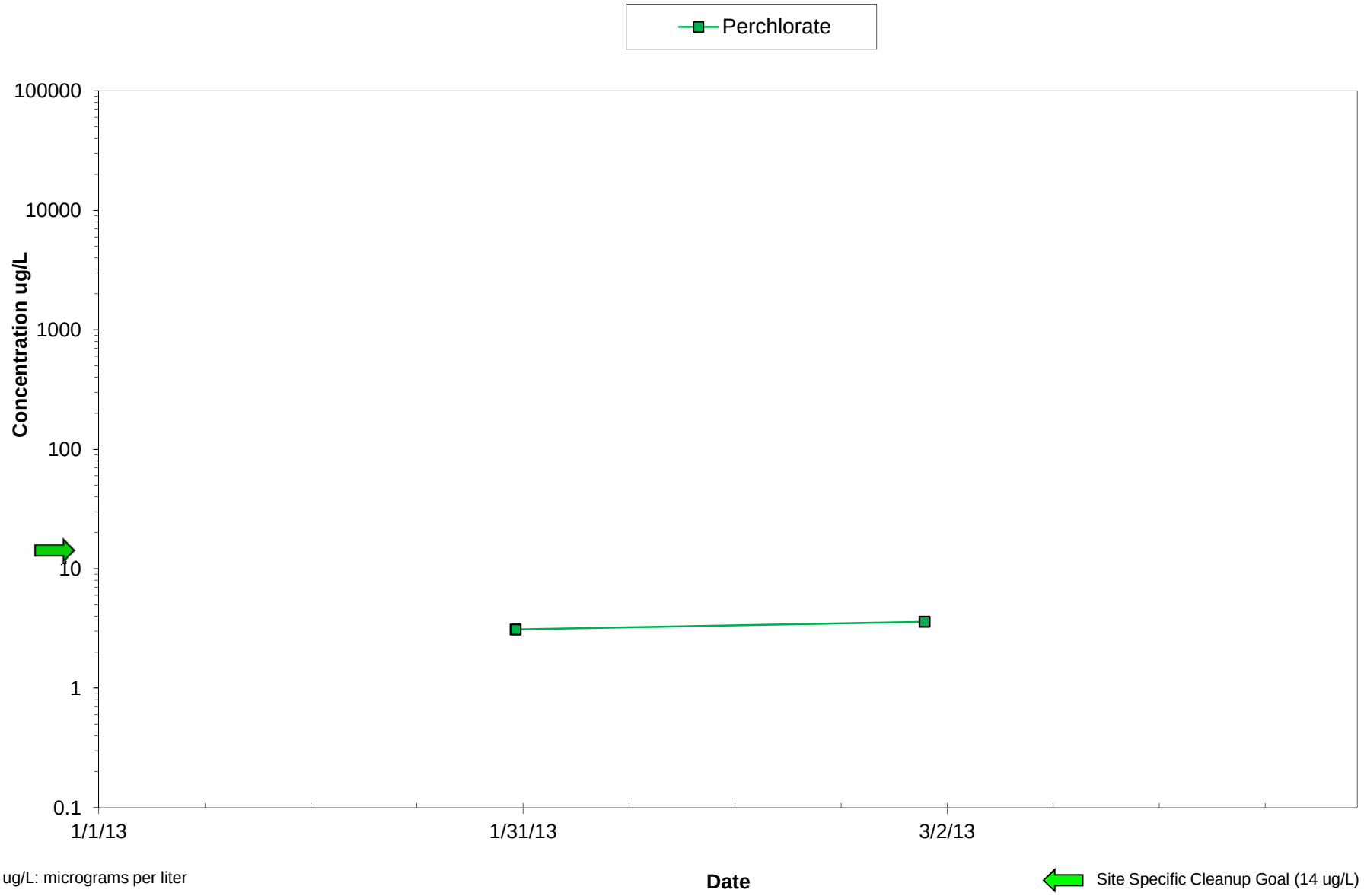
MATRIXNEWORLD
Enabling Progress

EPA MW-26A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona

ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

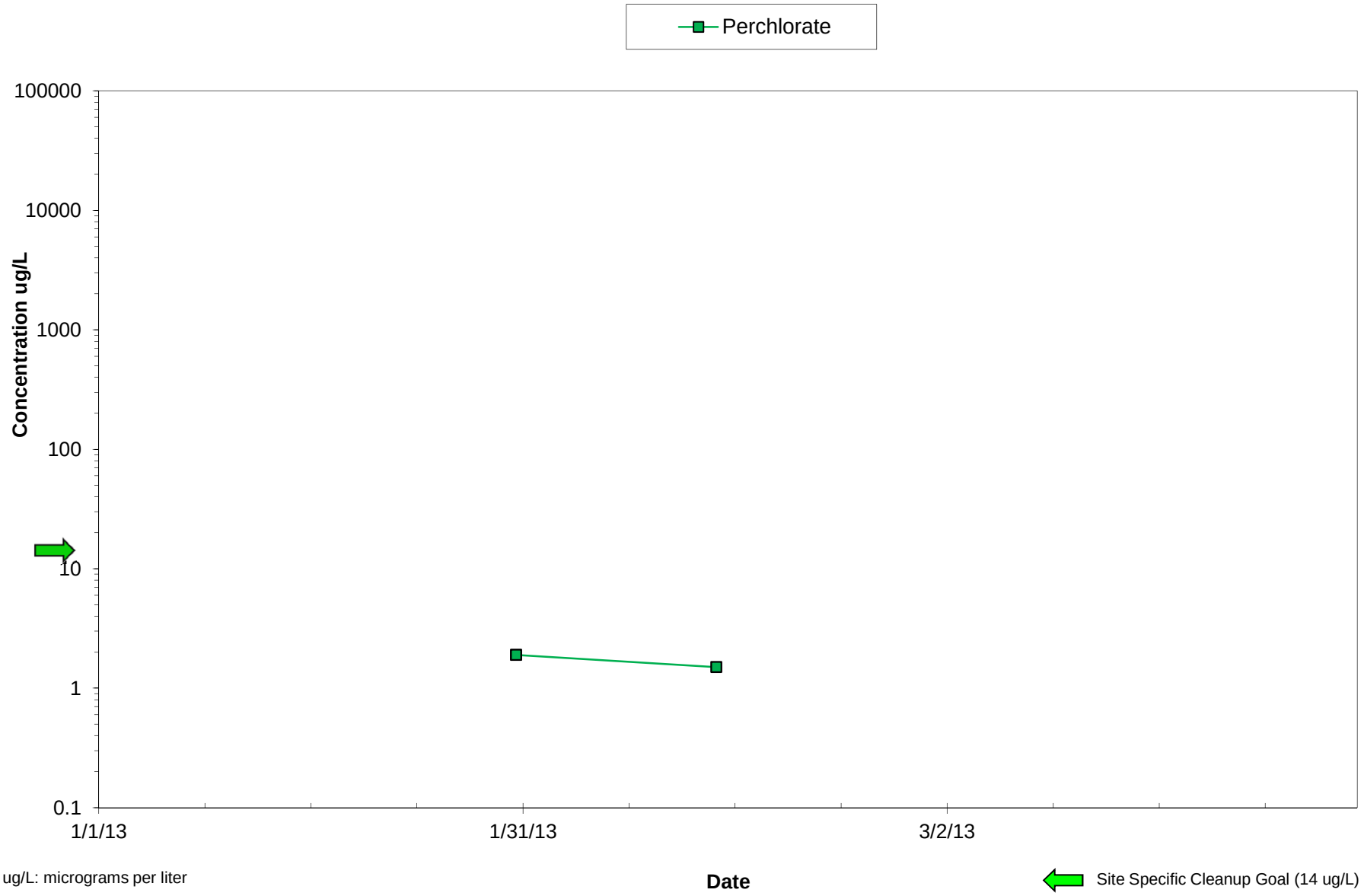
EPA MW-27A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

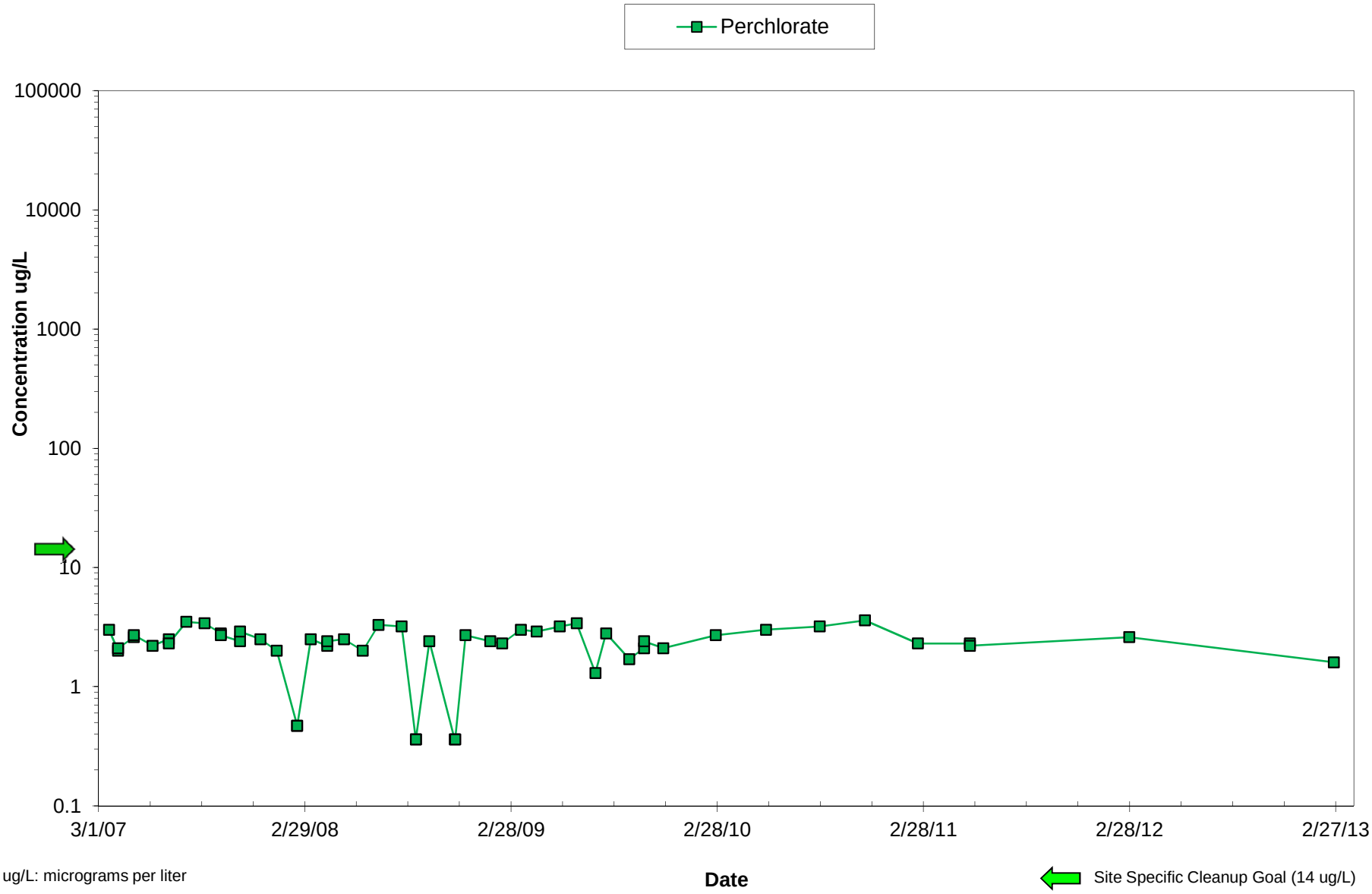
EPA MW-28A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

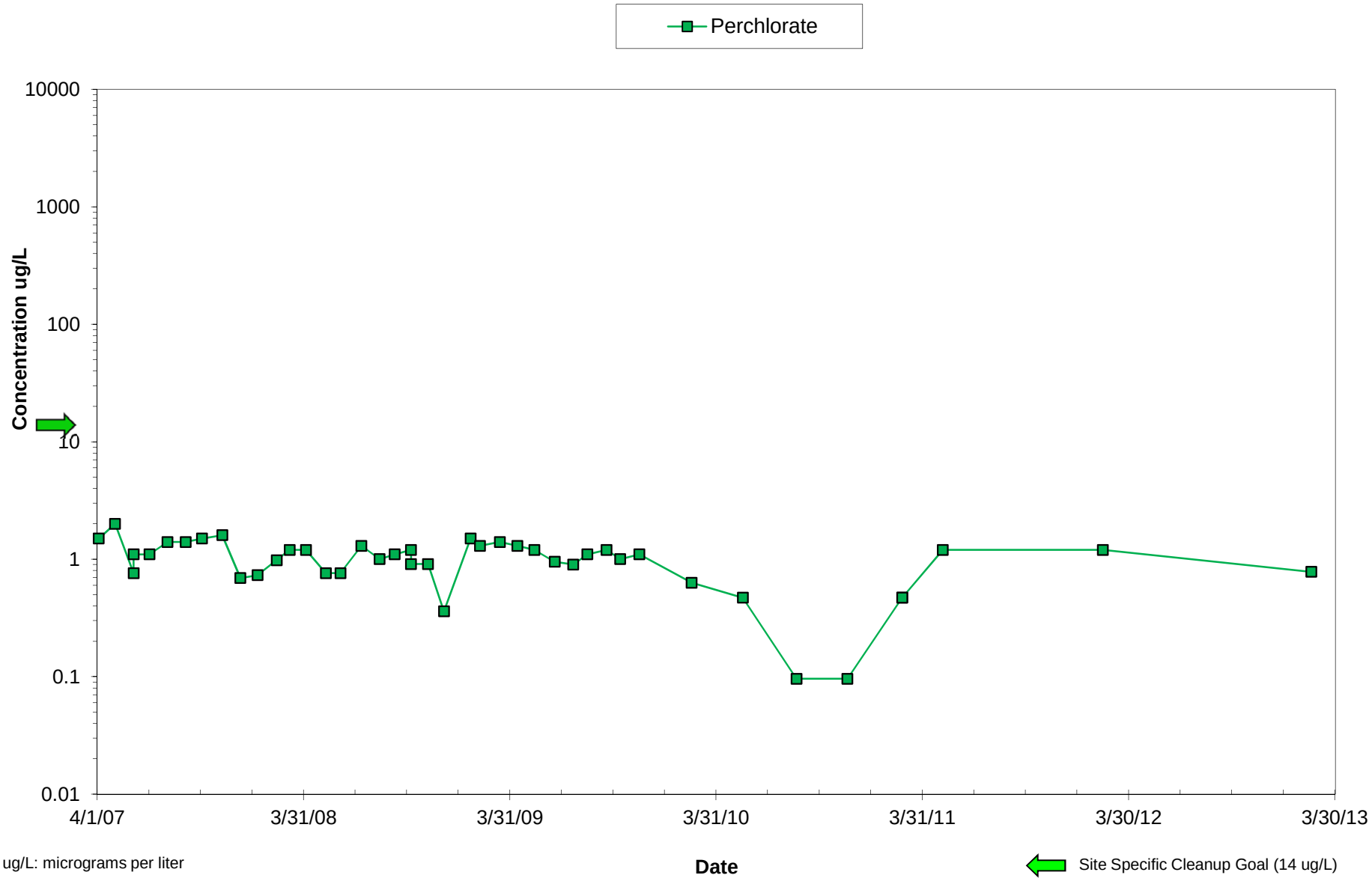
EPA MW-30A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

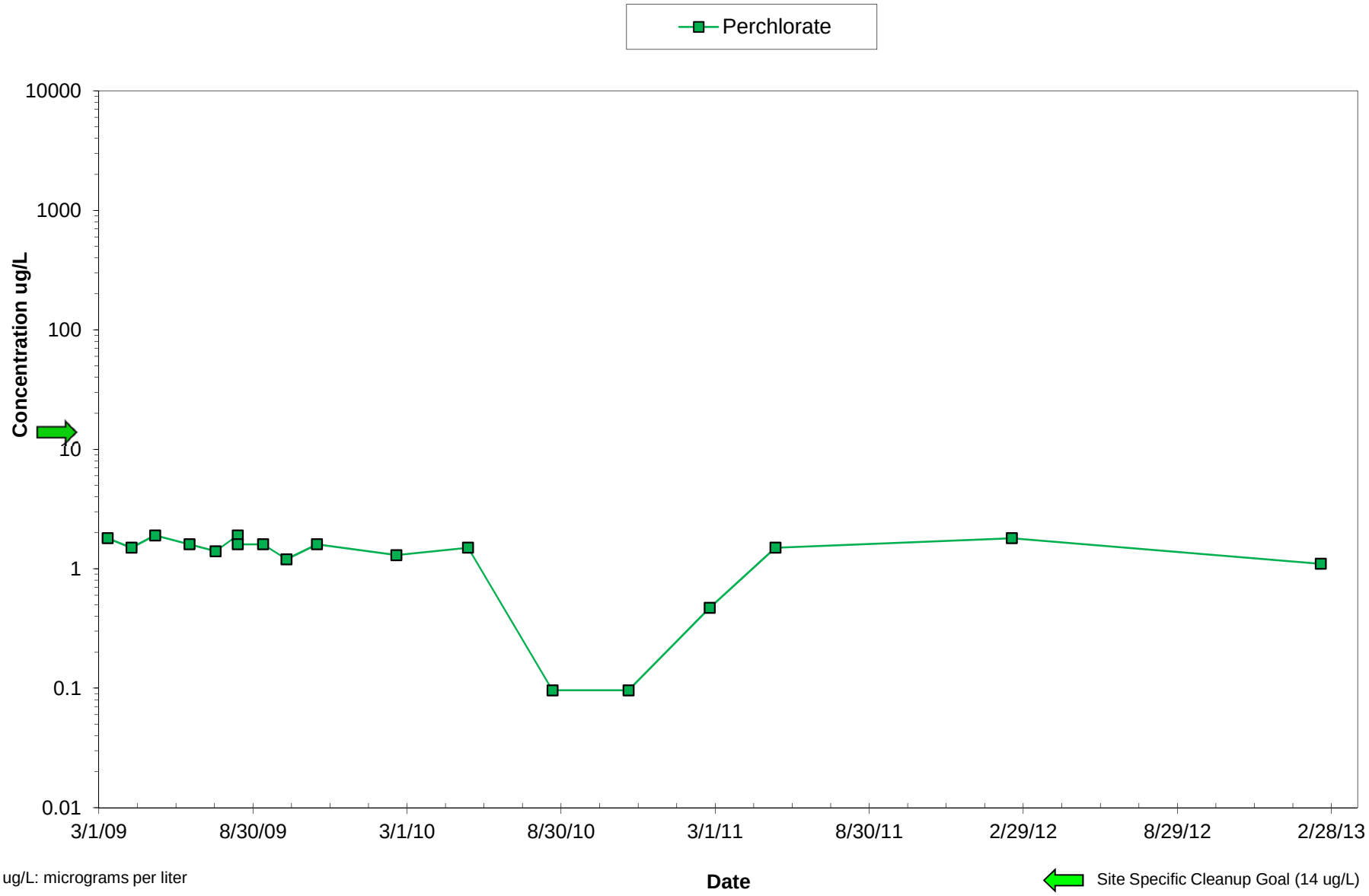
EPA MW-31A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

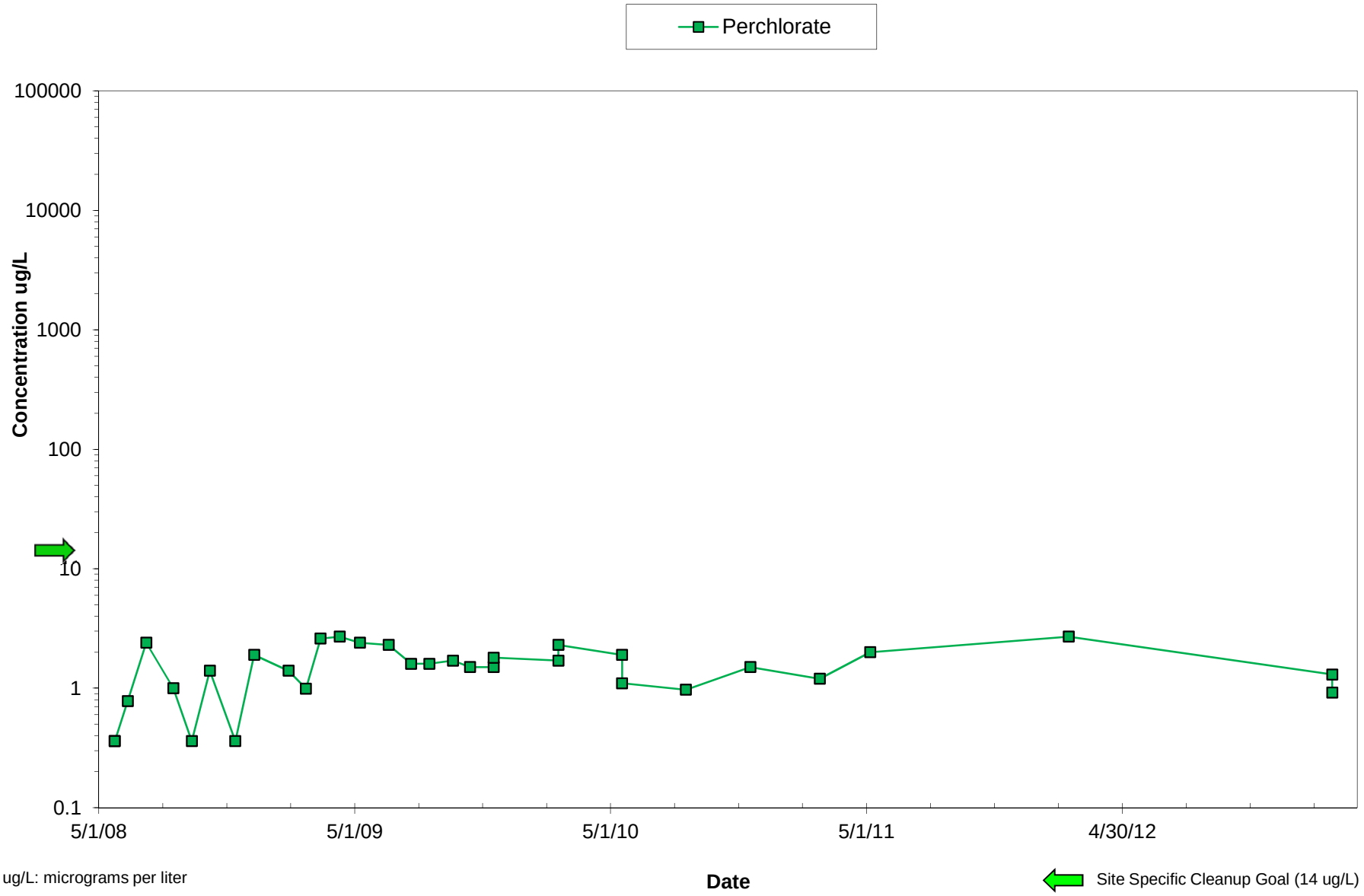
EPA MW-32A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

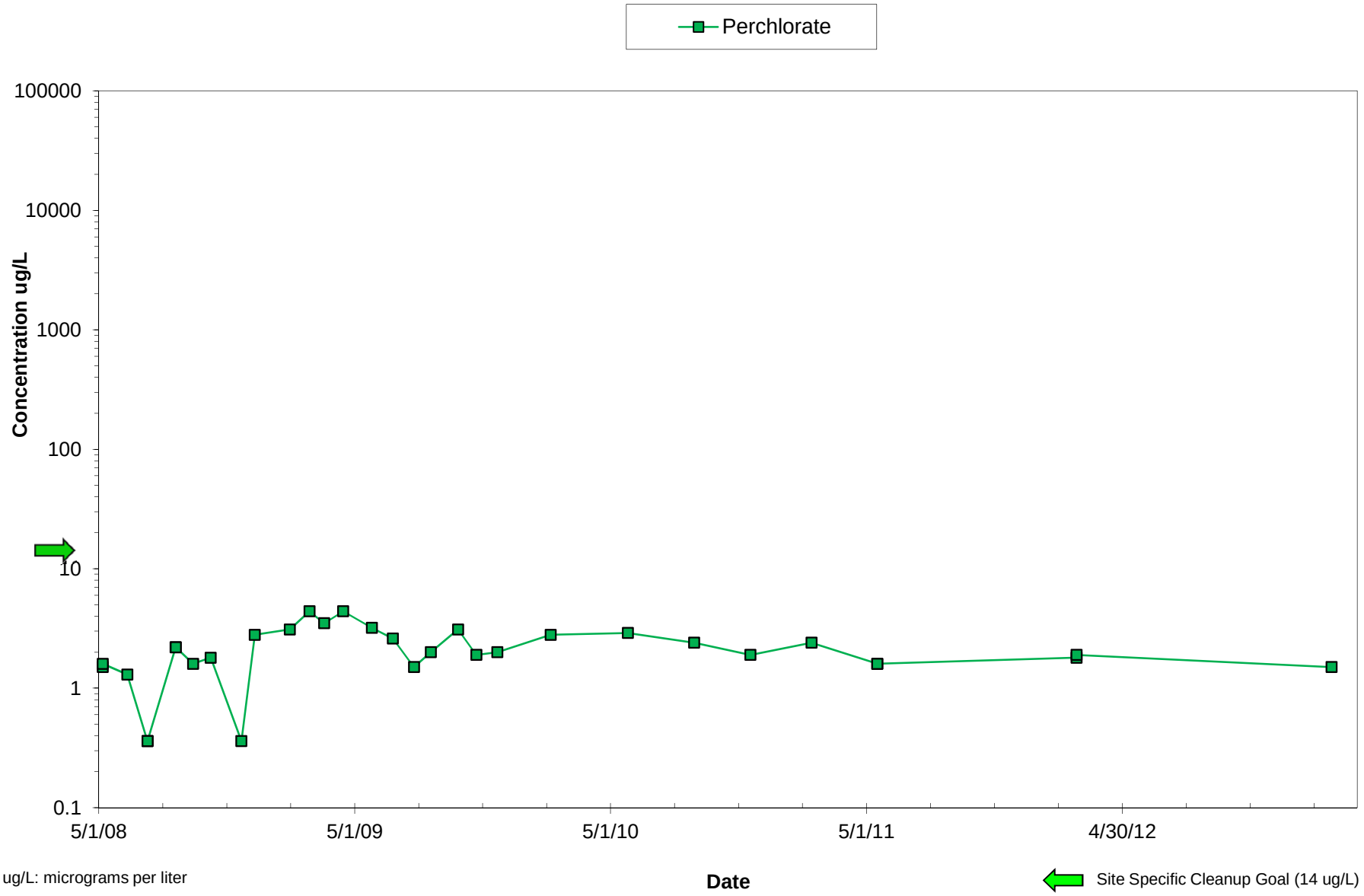
EPA MW-34A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

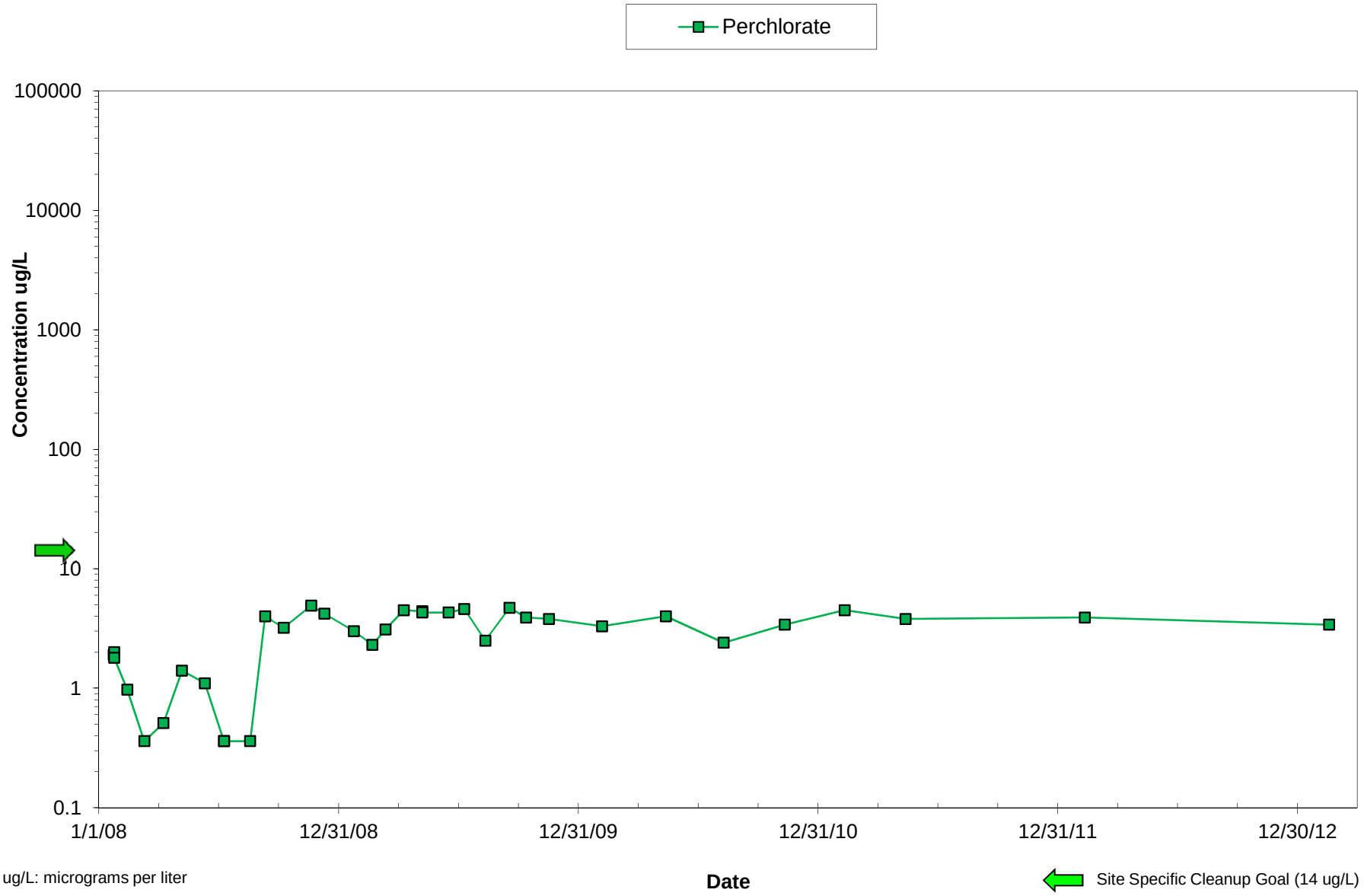
EPA MW-35A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

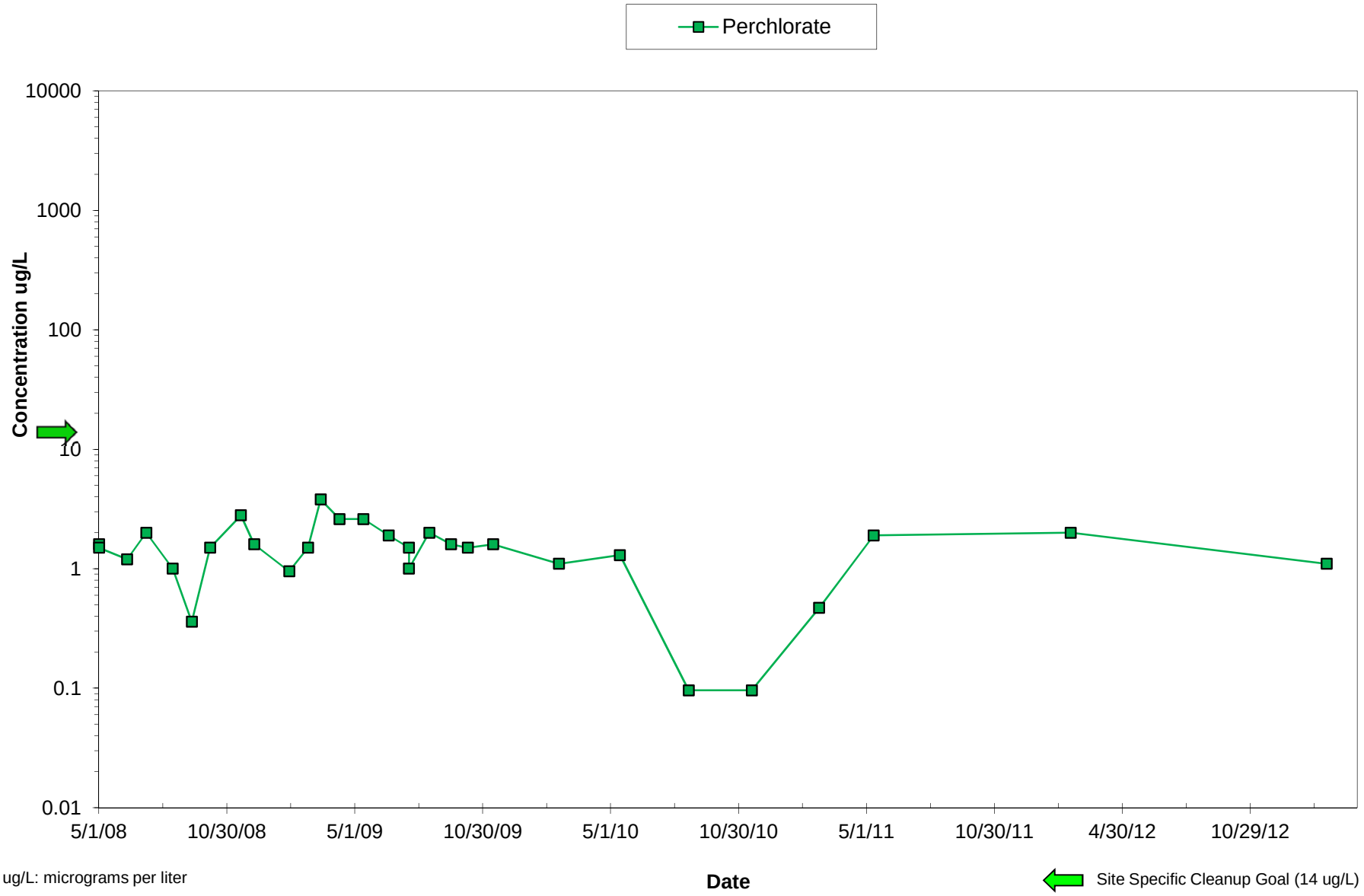
EPA MW-36A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

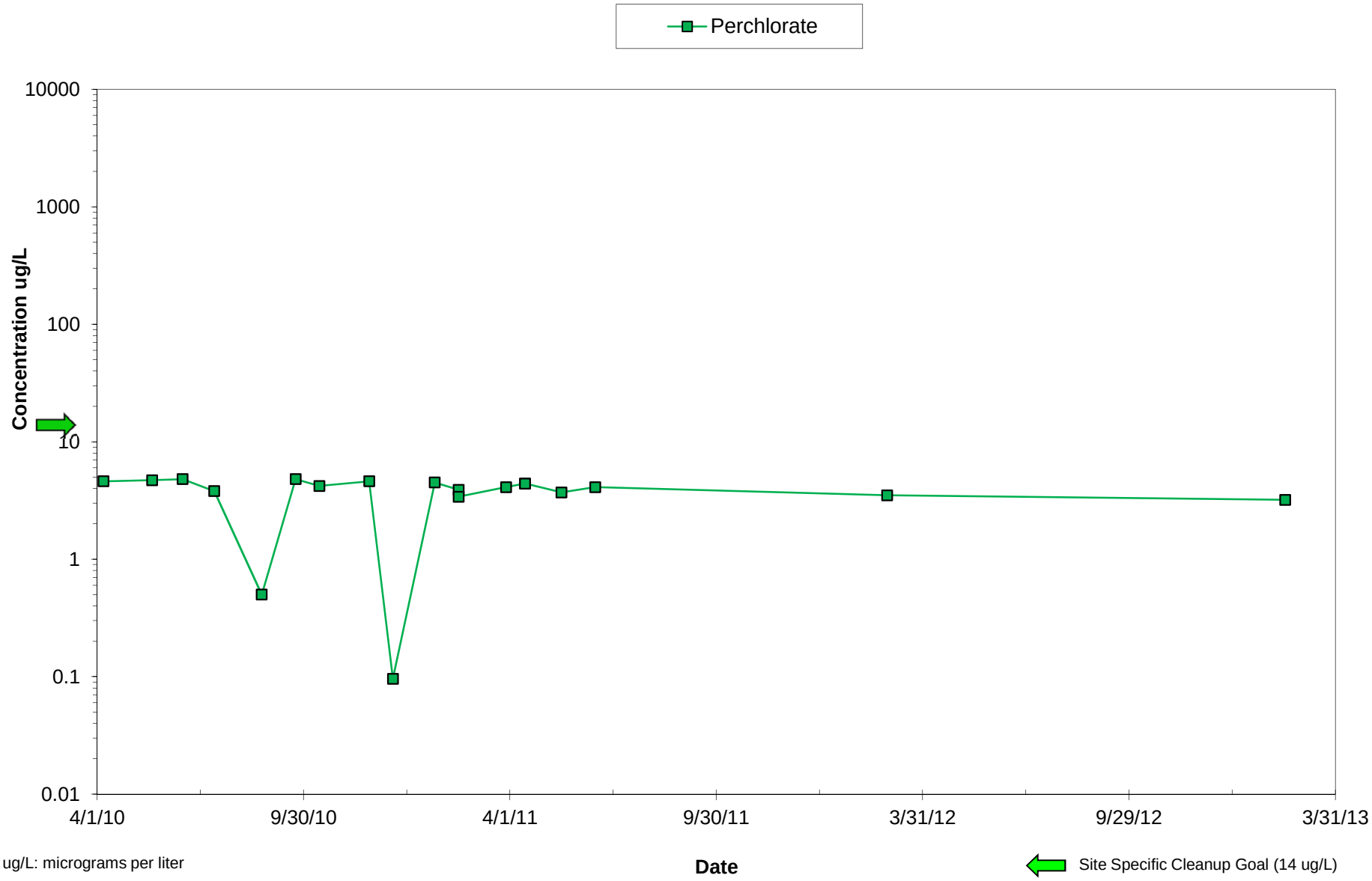
EPA MW-37A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

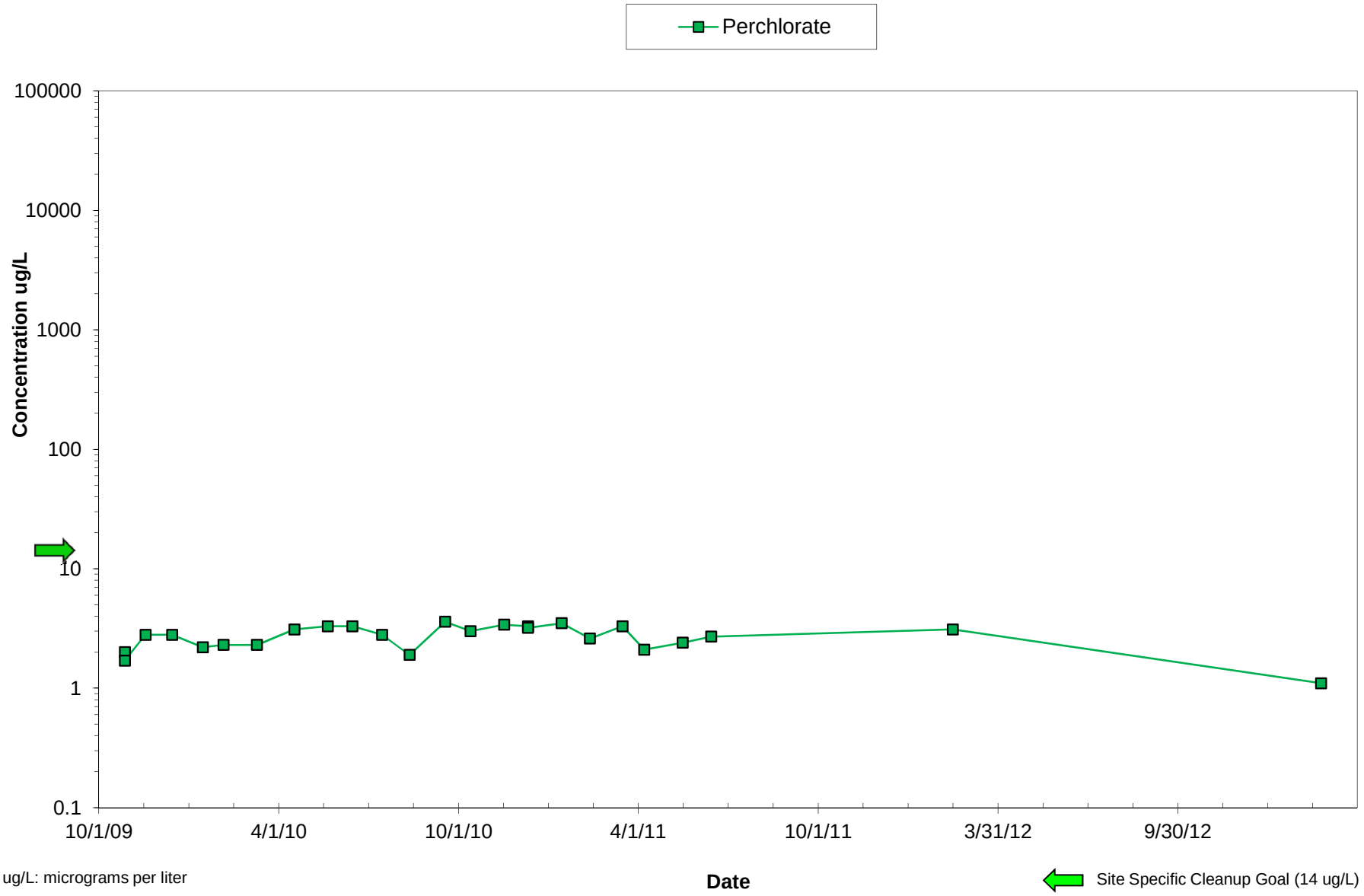
EPA MW-38A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

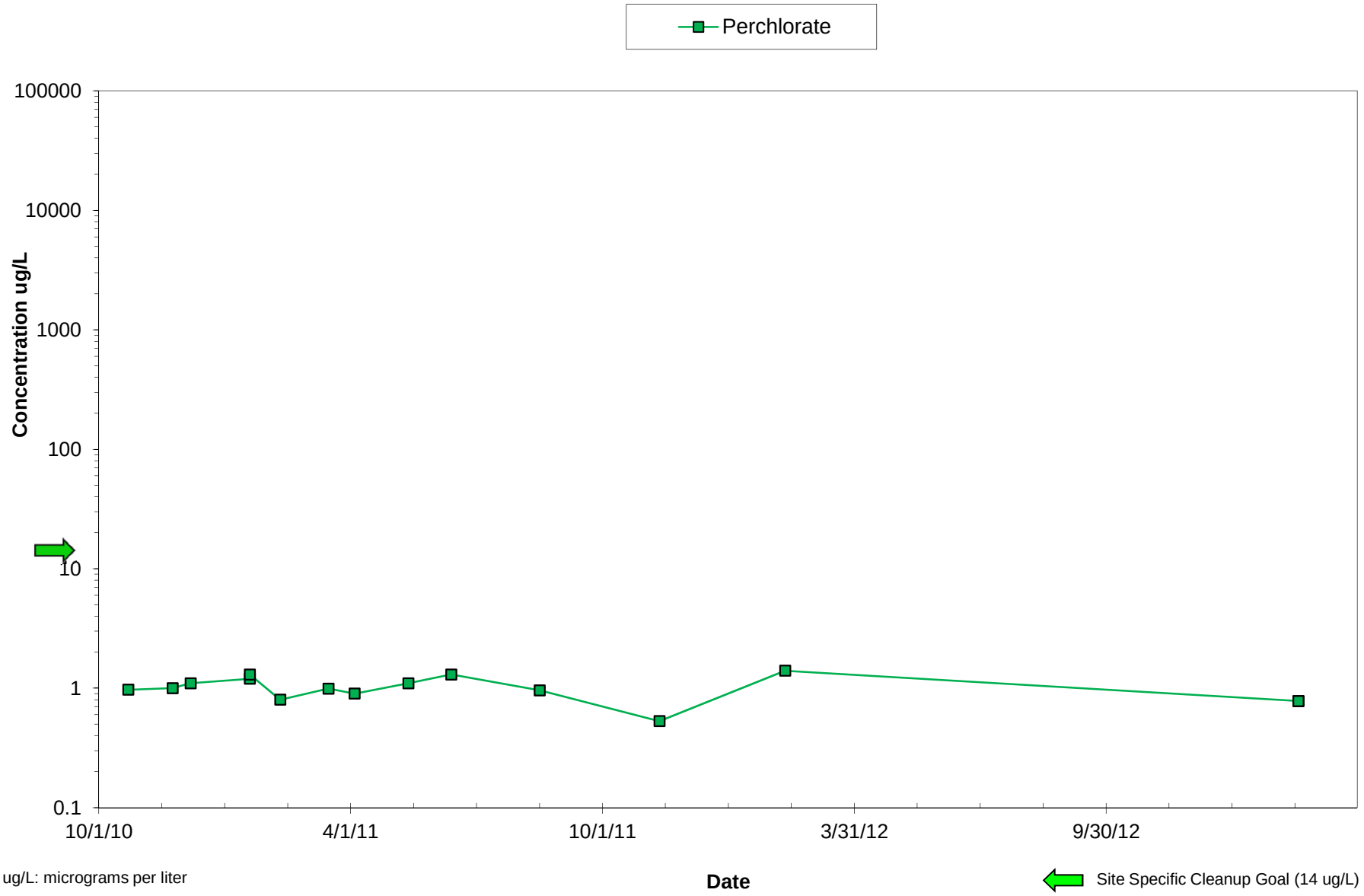
EPA MW-39A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

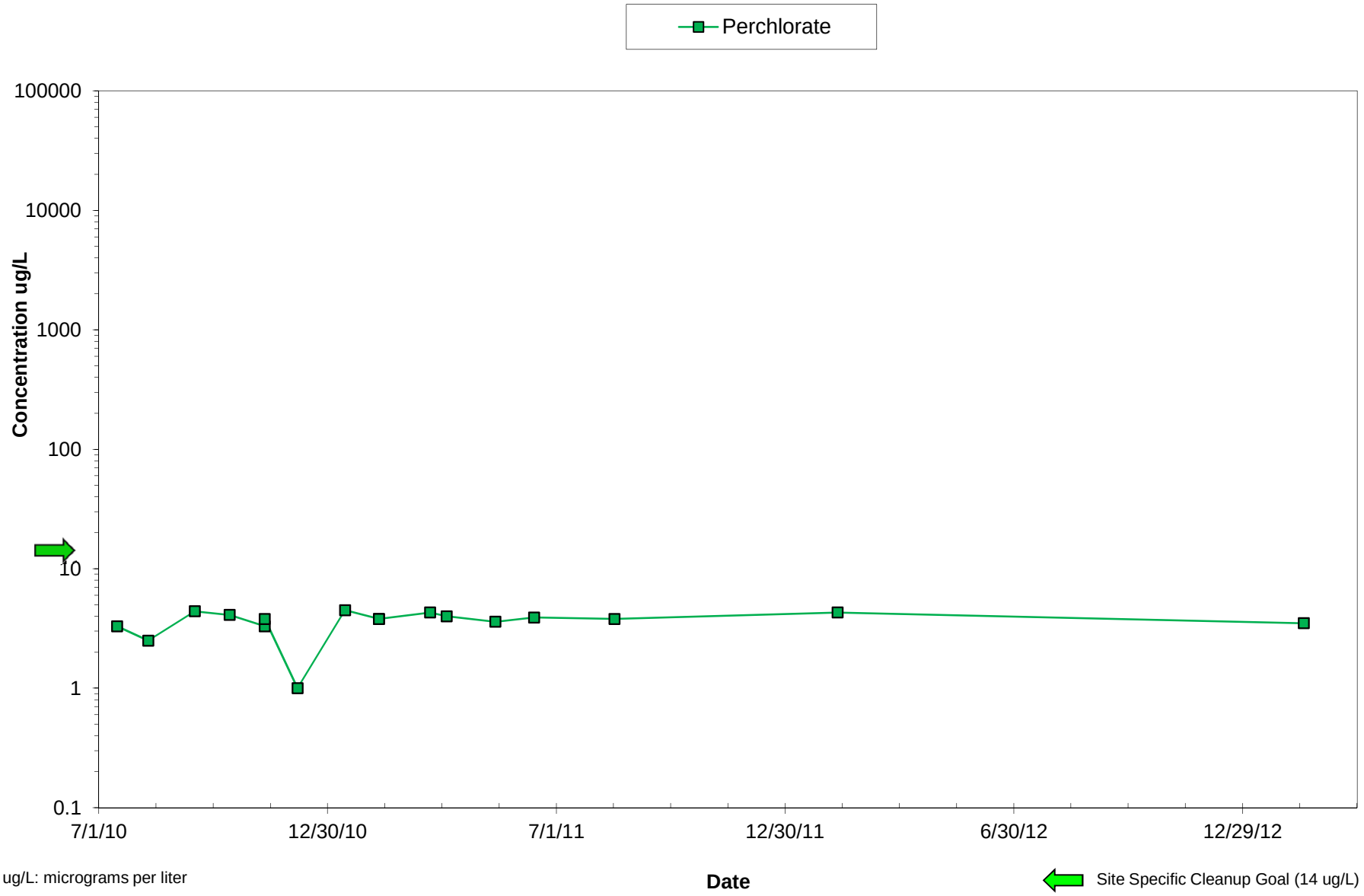
EPA MW-40A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

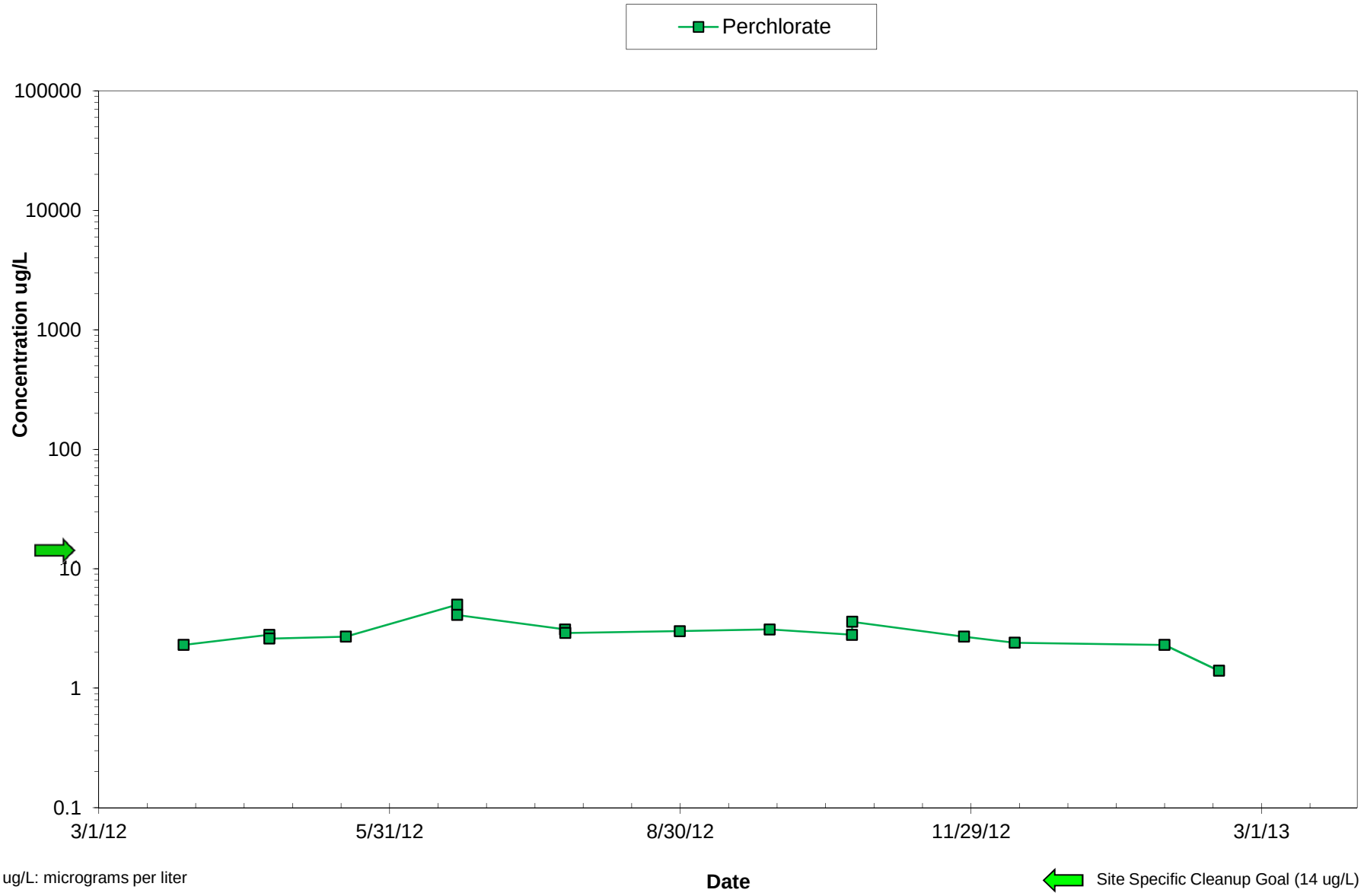
EPA MW-41A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

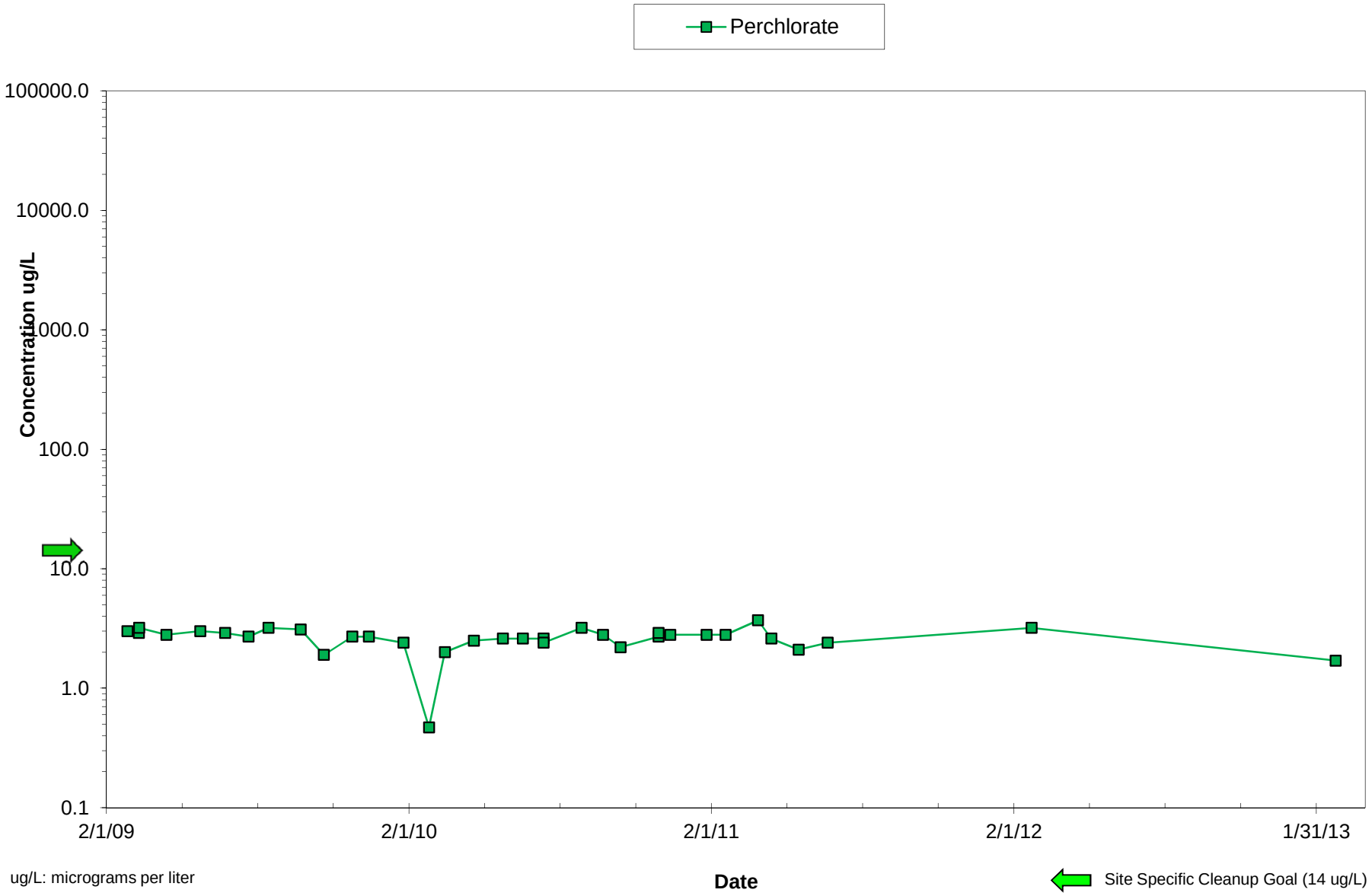
EPA MW-42A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

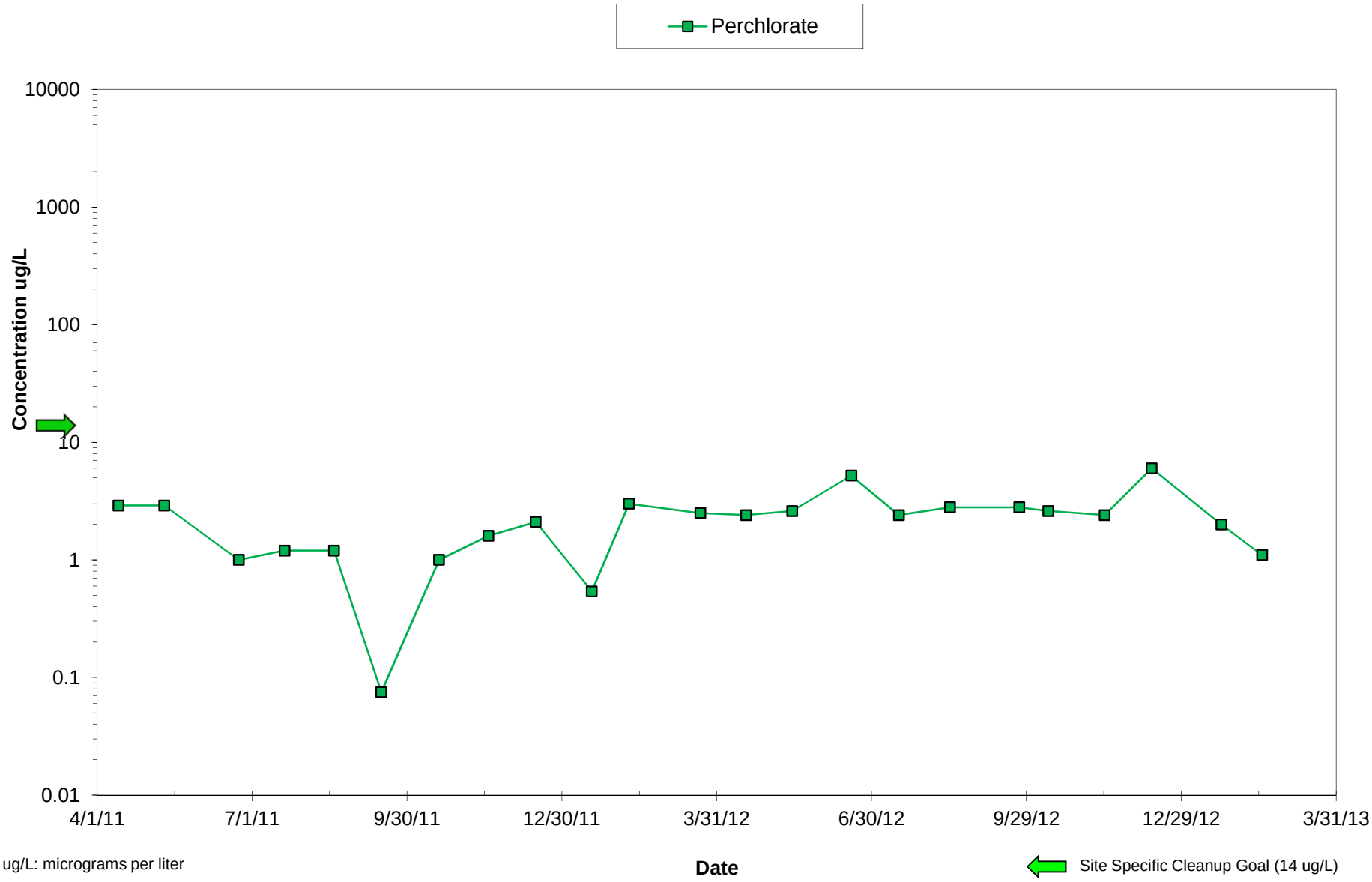
EPA MW-43A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

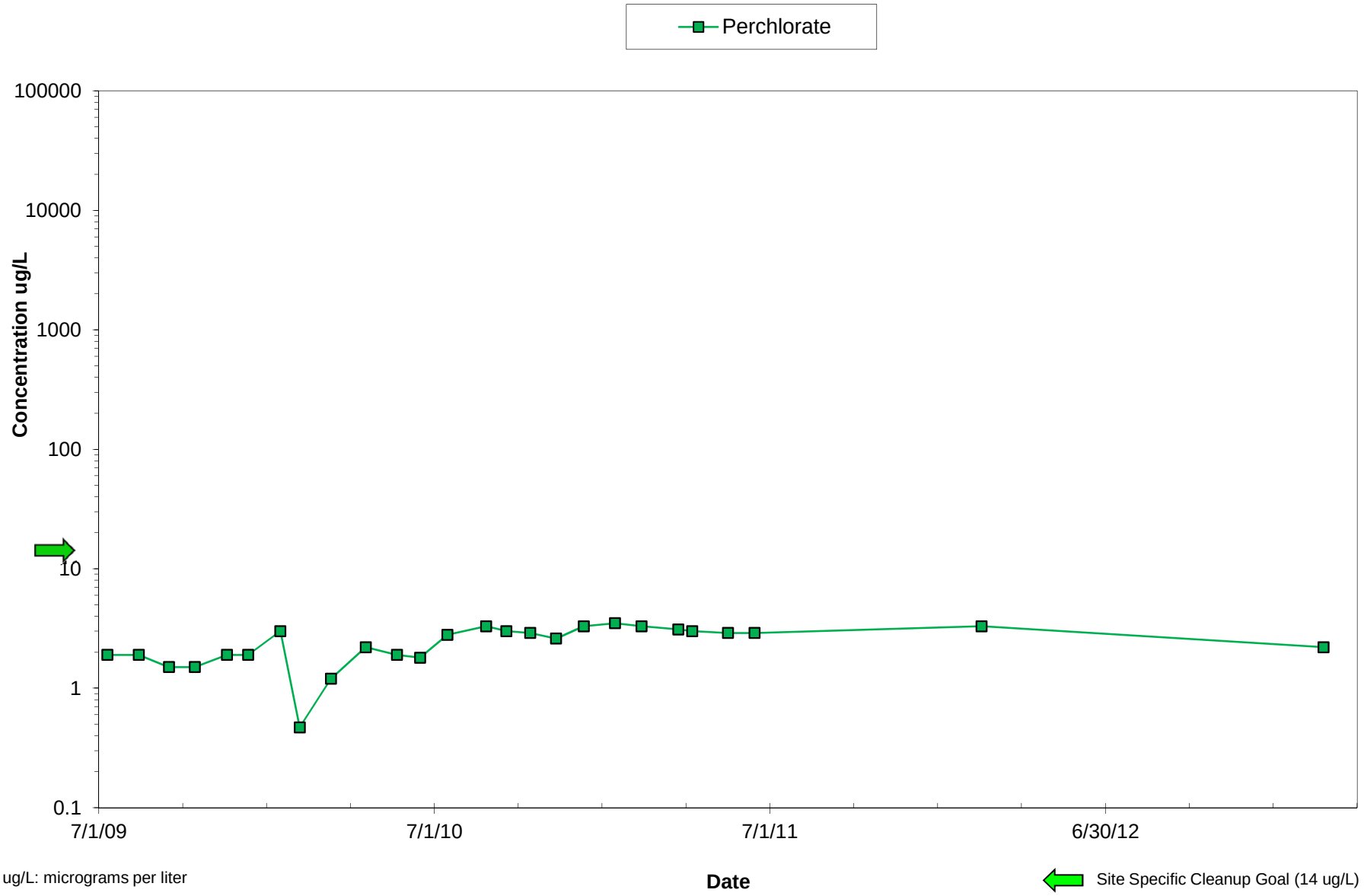
EPA MW-44A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

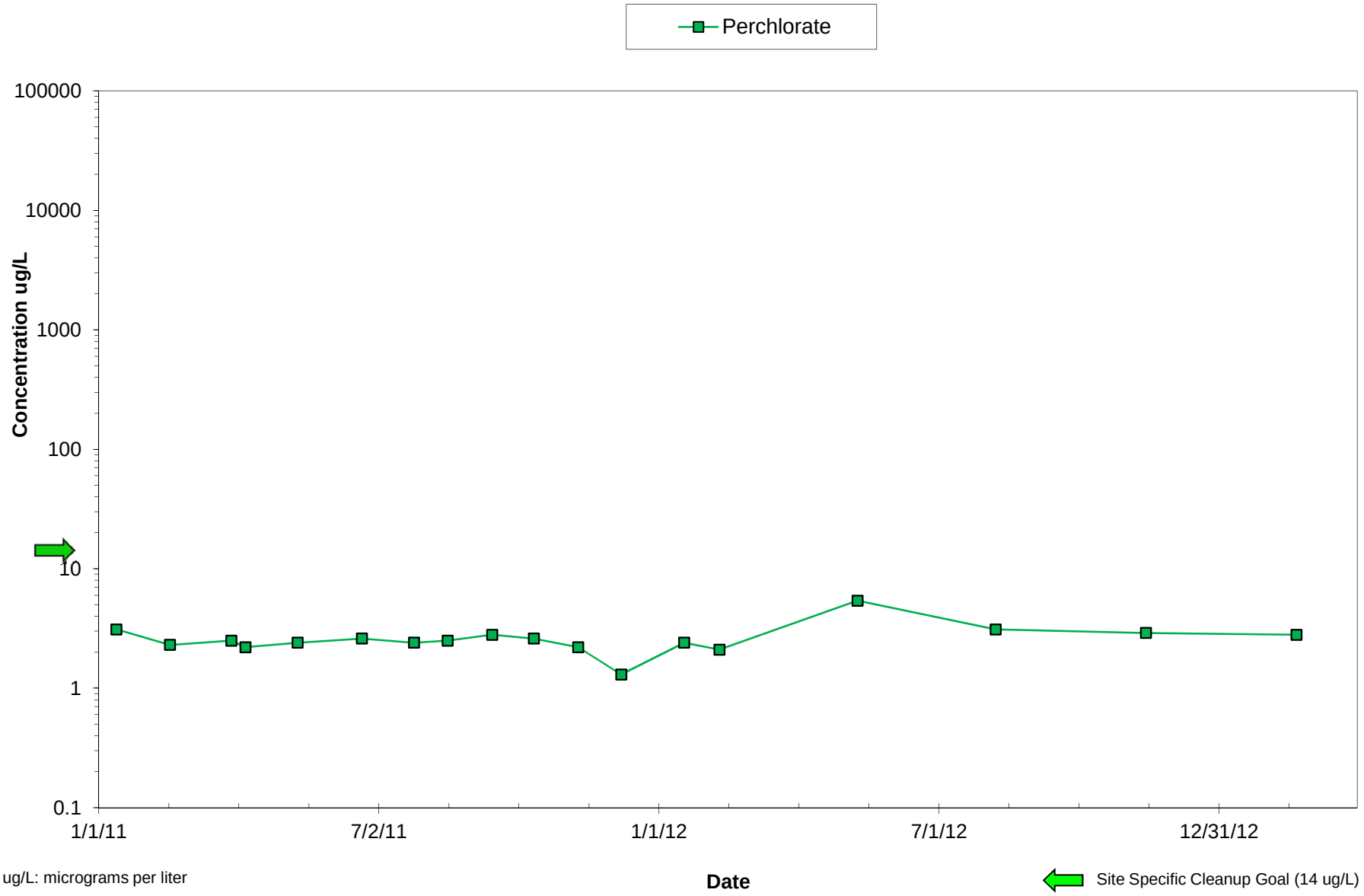
EPA MW-45A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

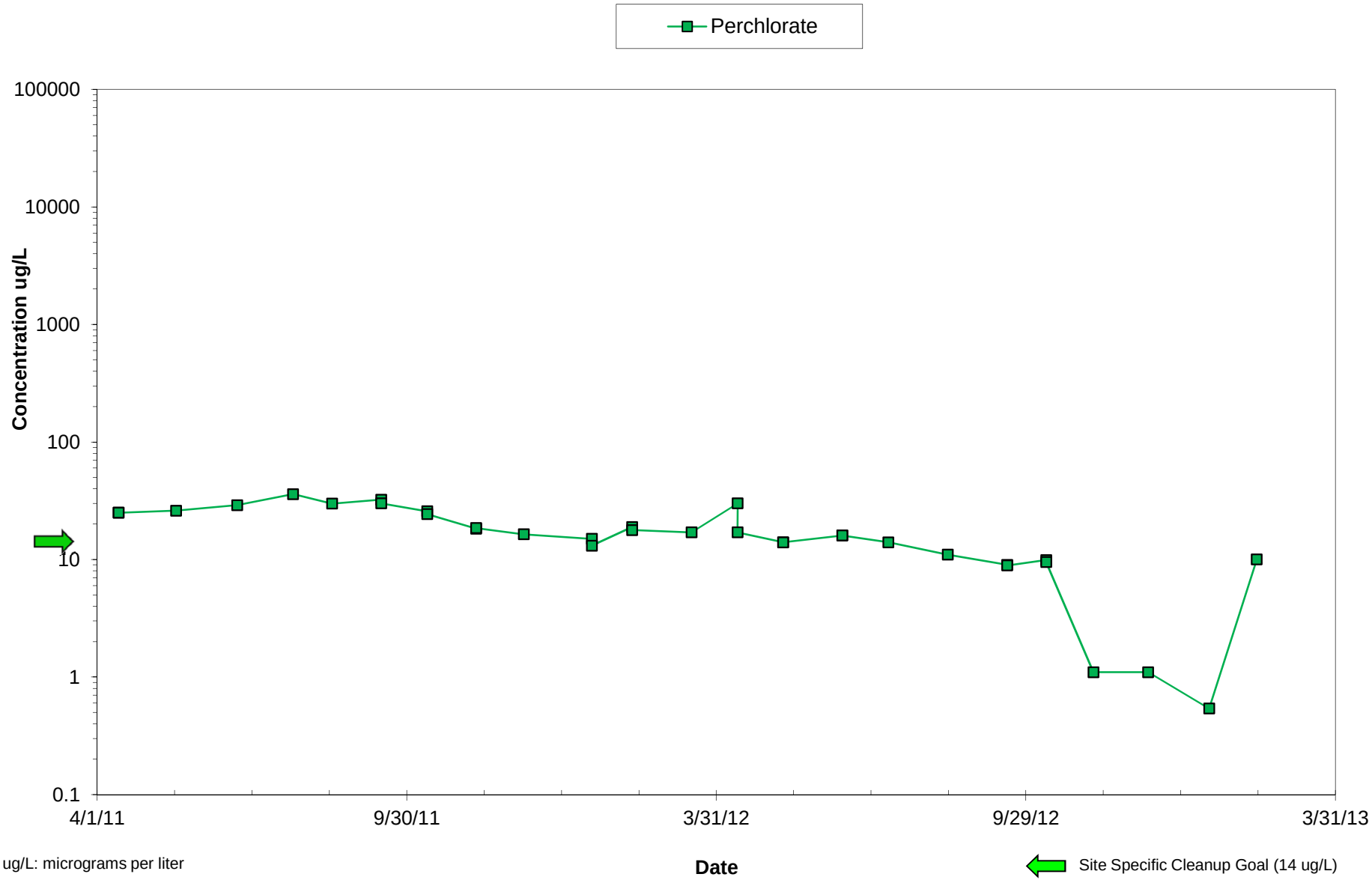
EPA MW-46A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

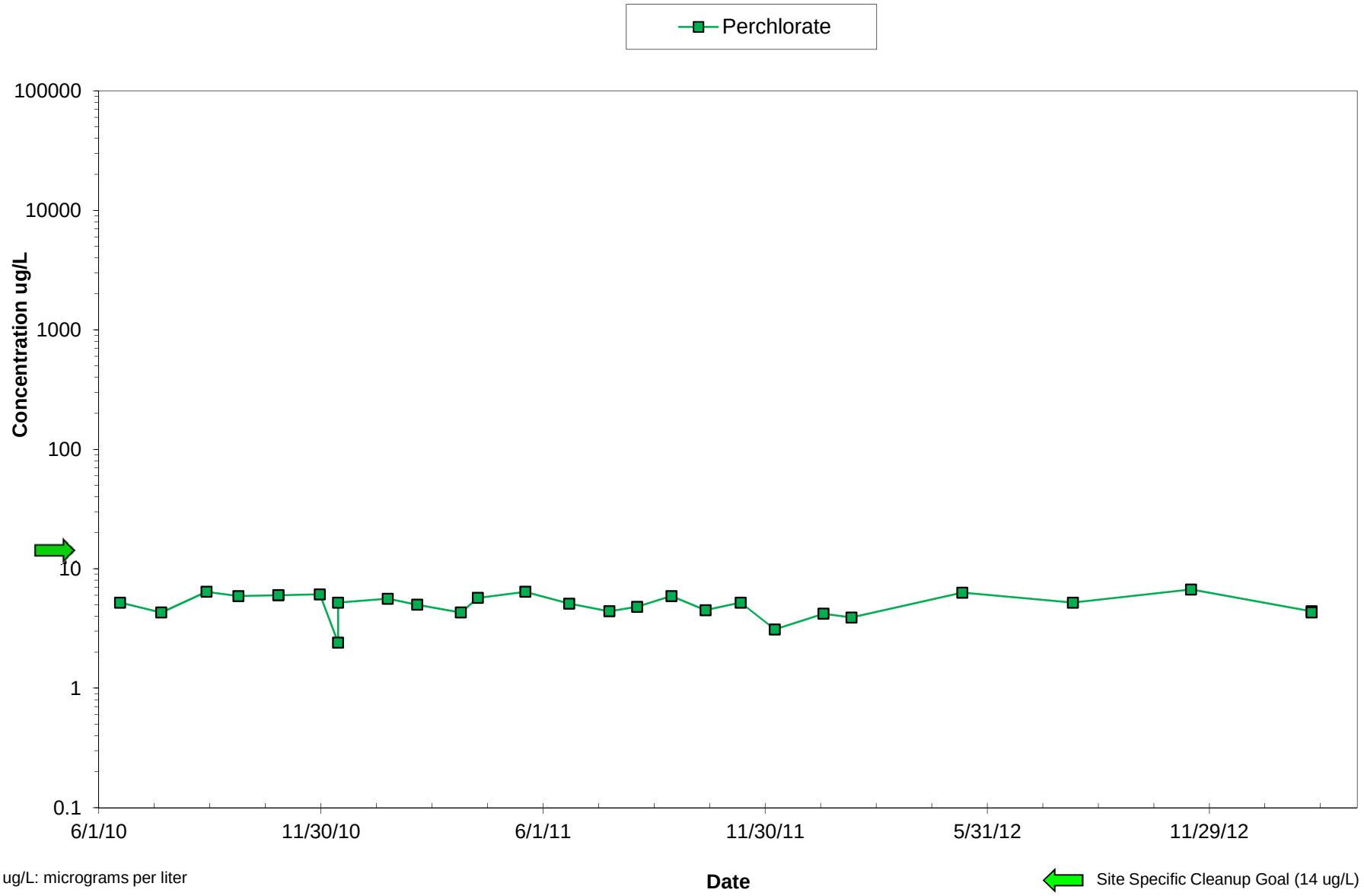
EPA MW-47A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

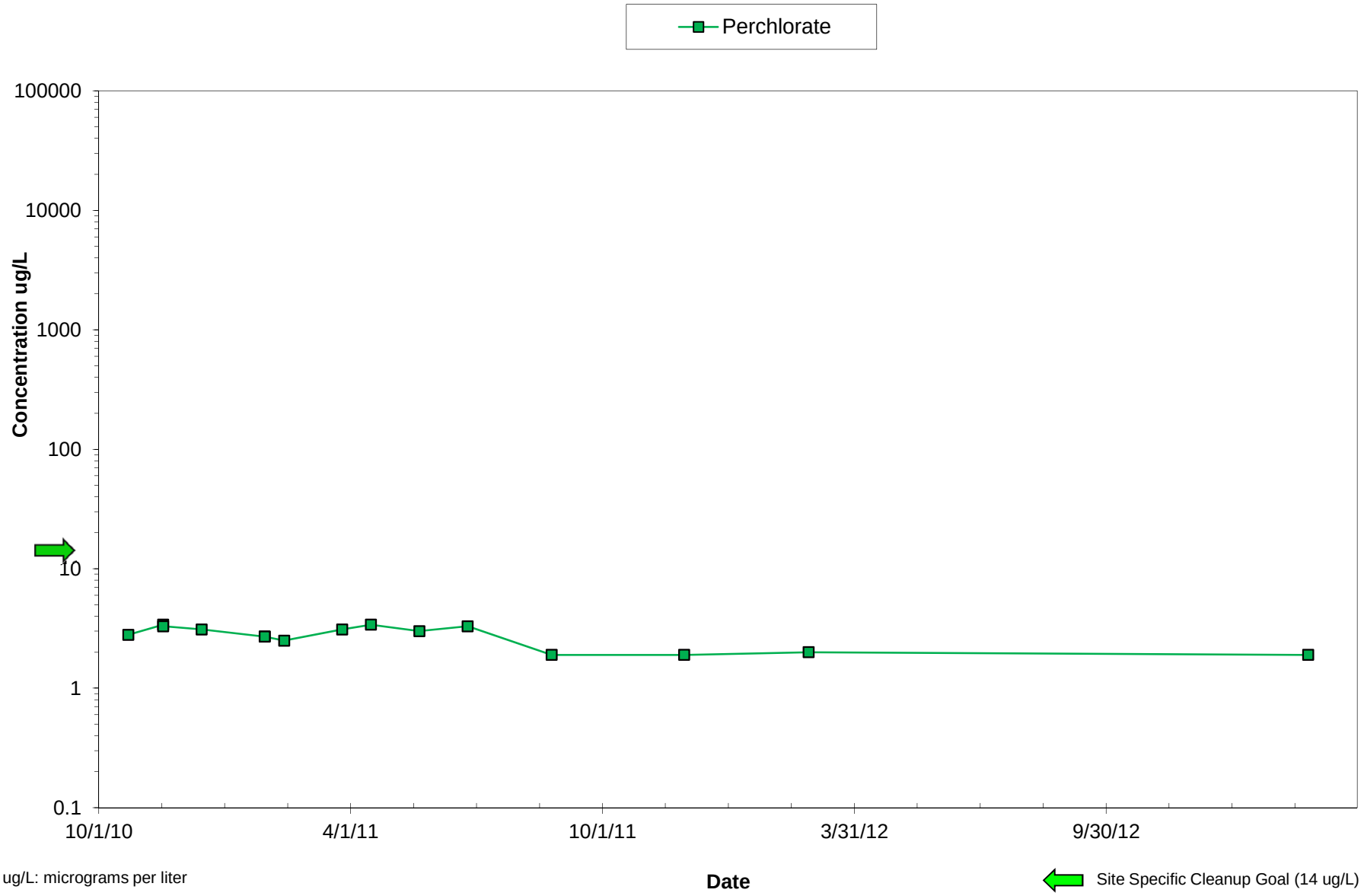
EPA MW-48A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

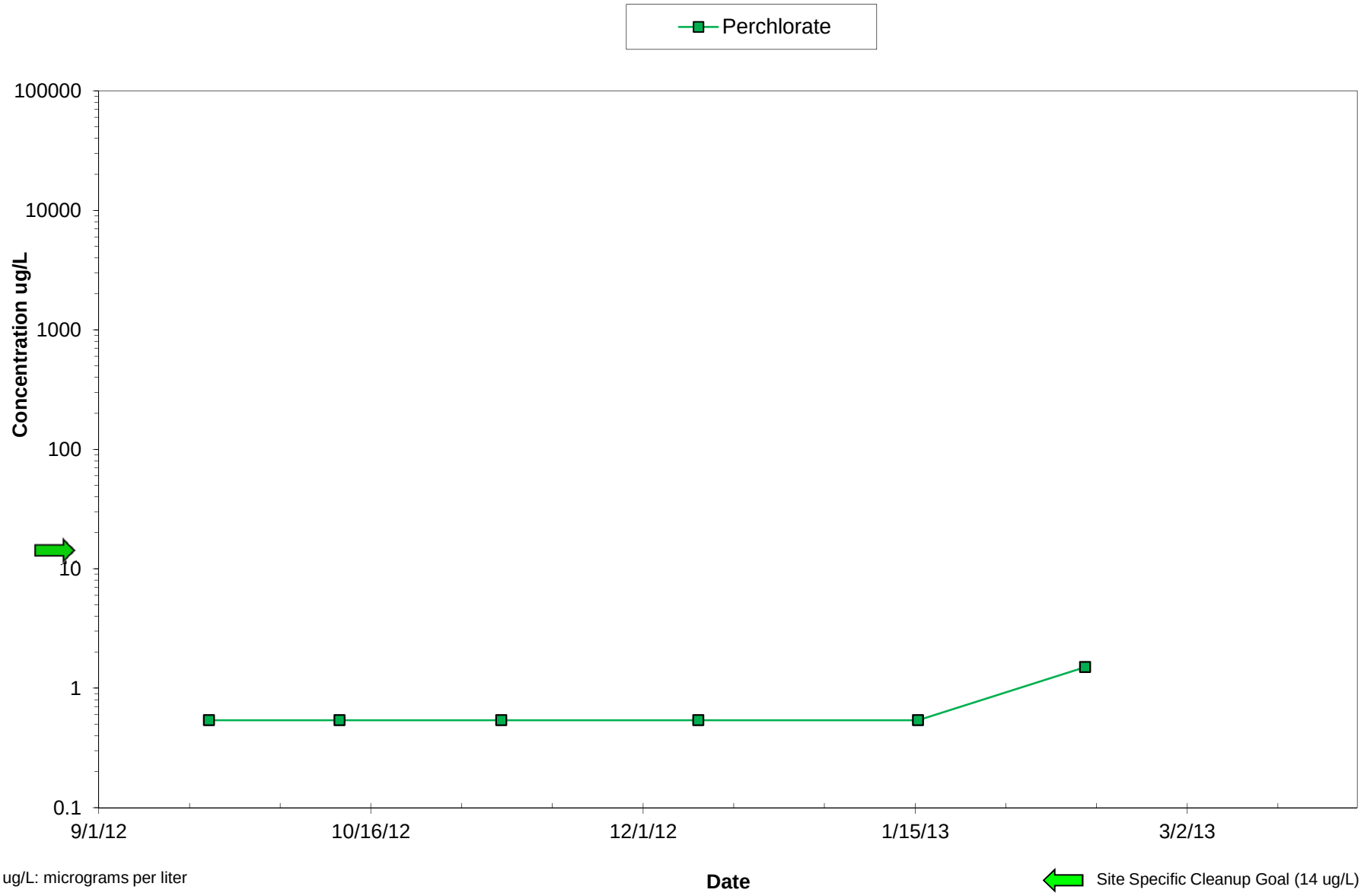
EPA MW-50A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

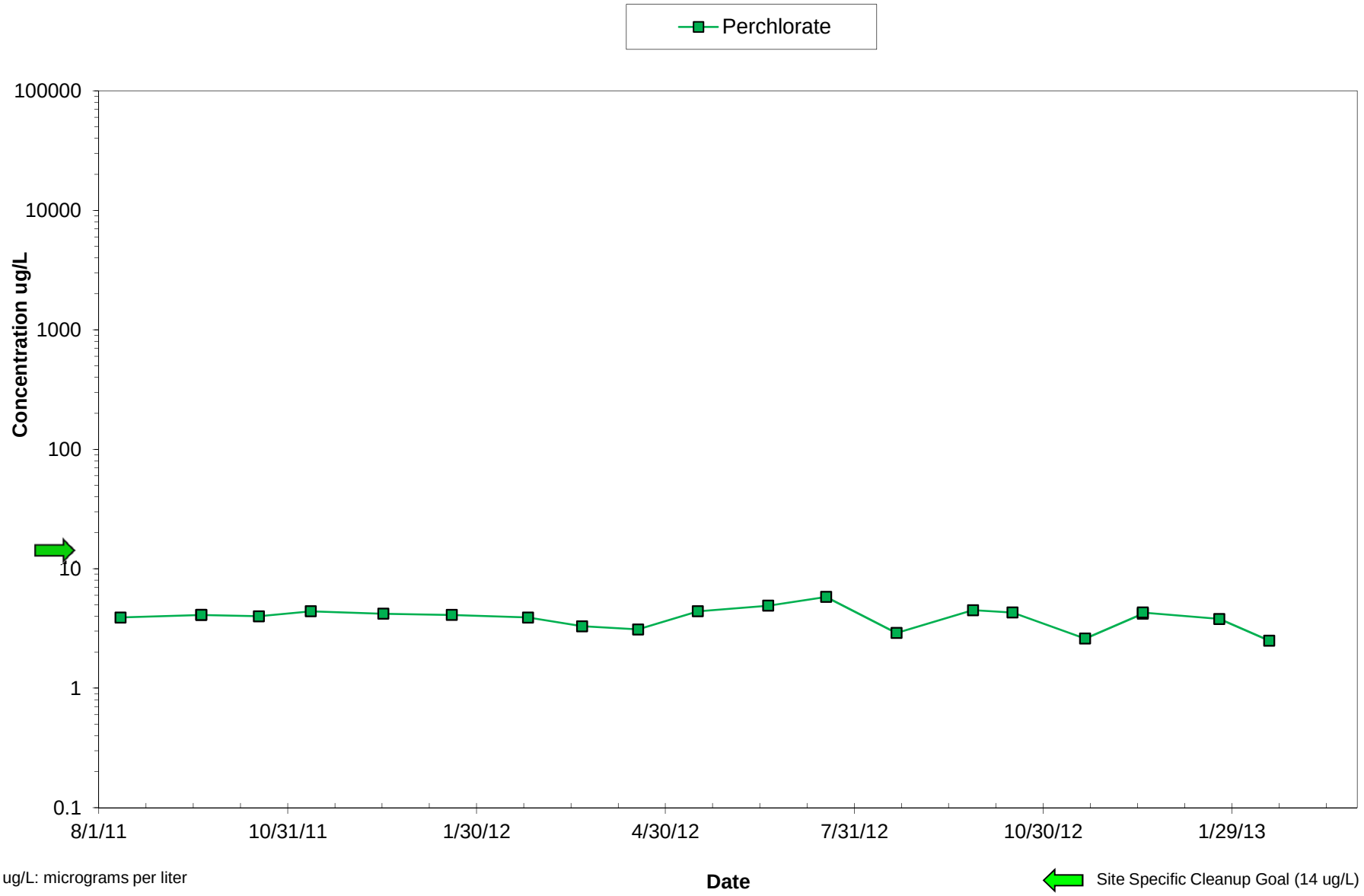
EPA MW-51A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

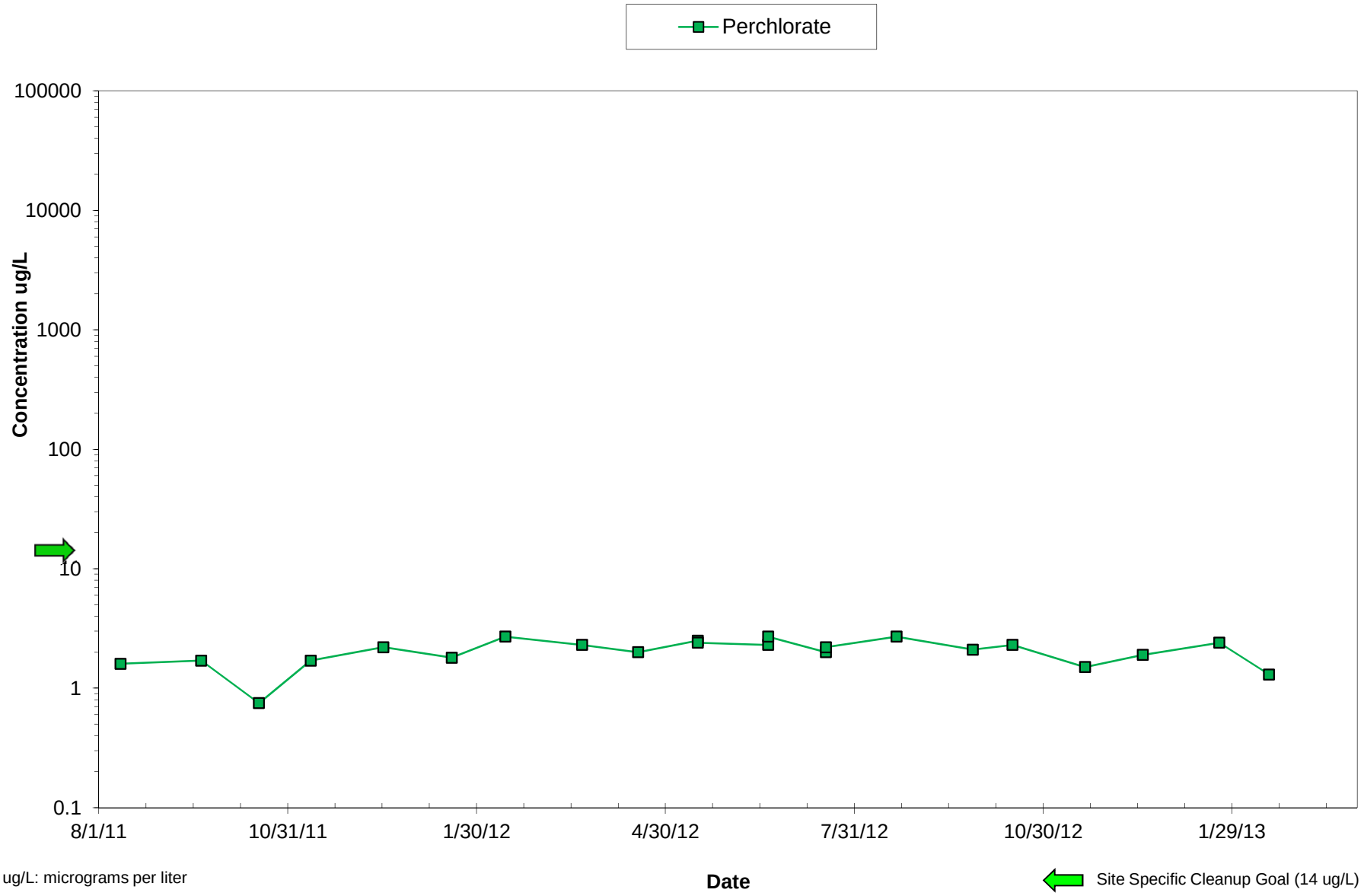
EPA MW-52A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

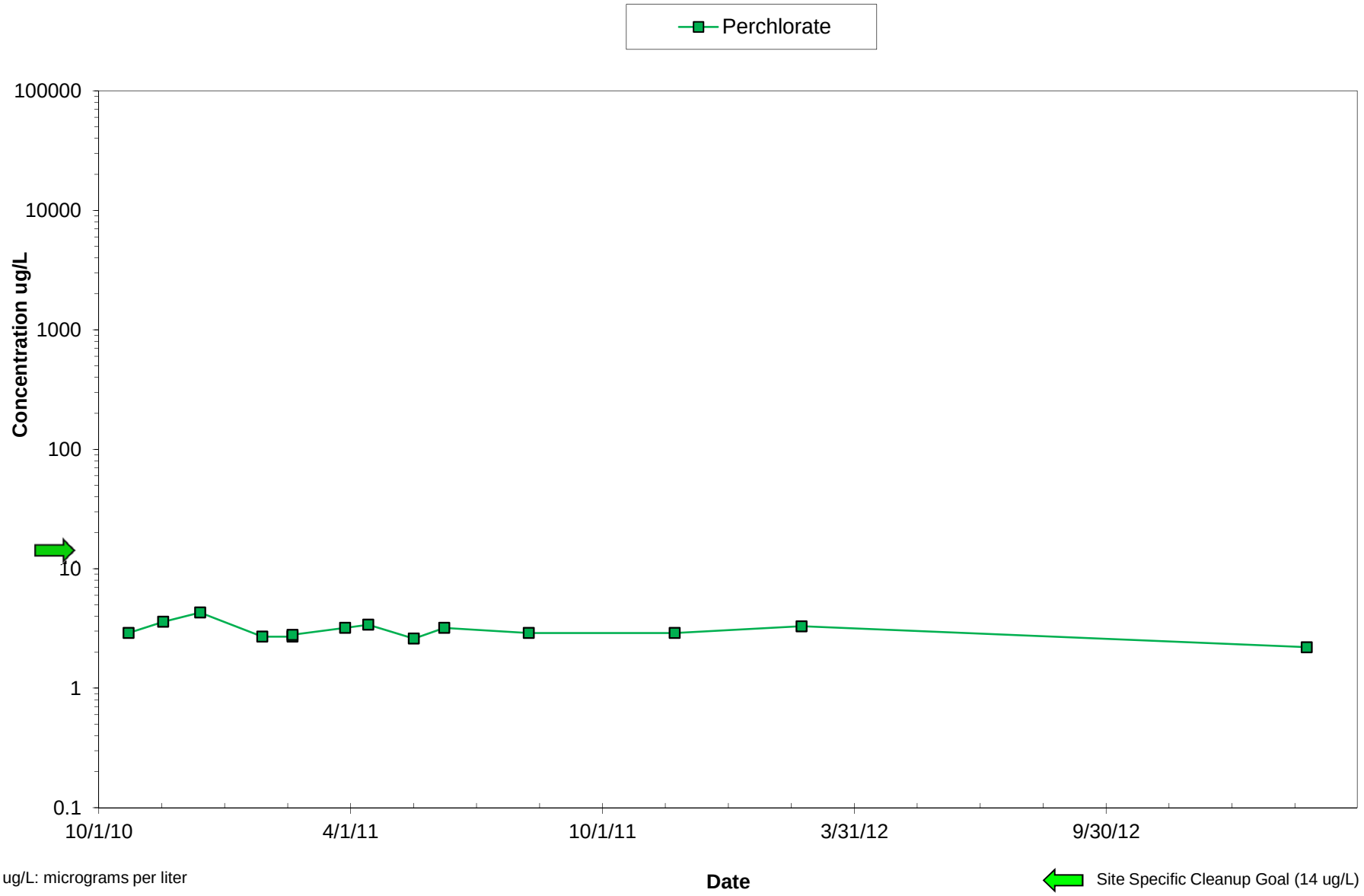
EPA MW-53A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

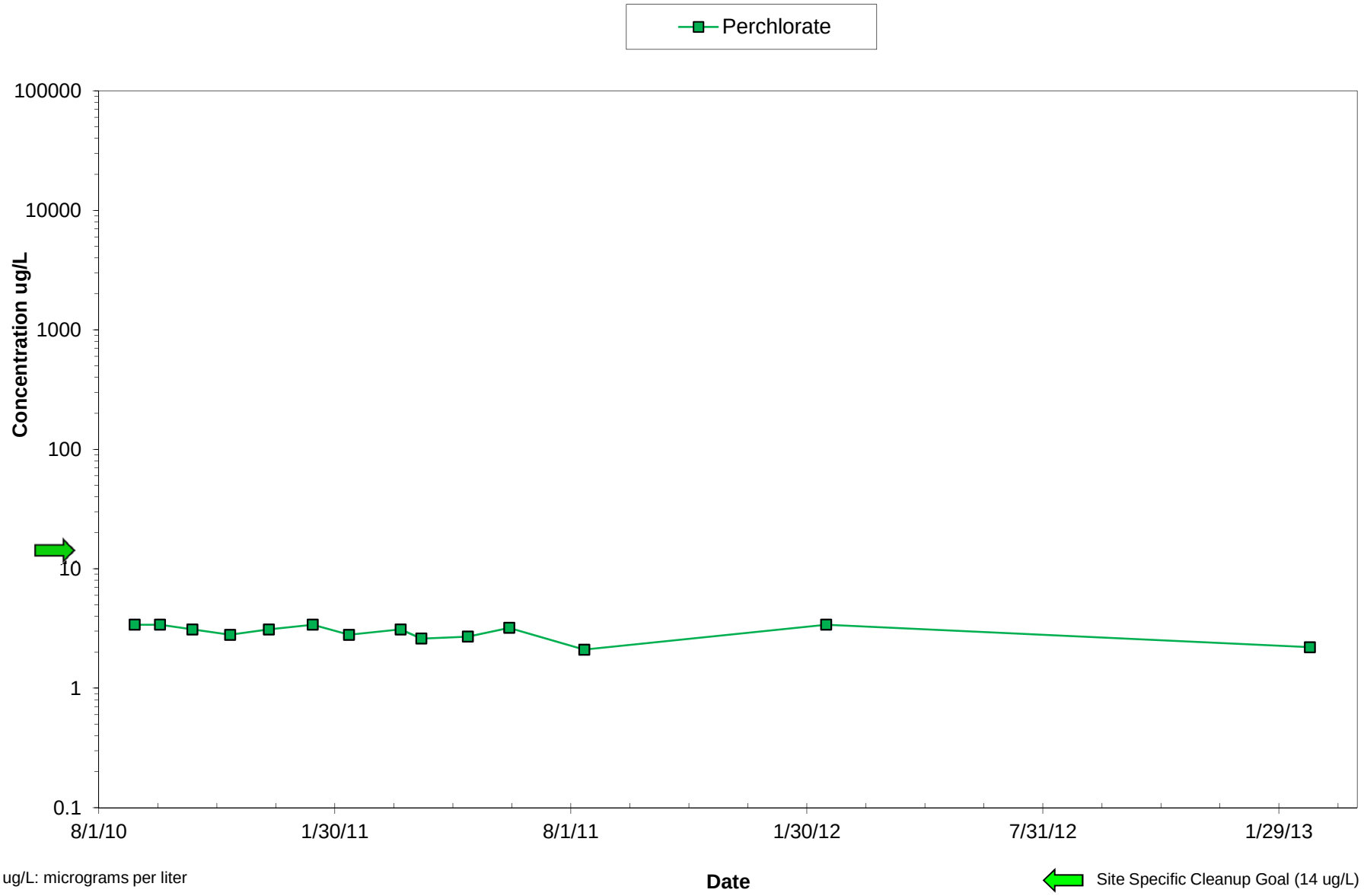
EPA MW-54A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

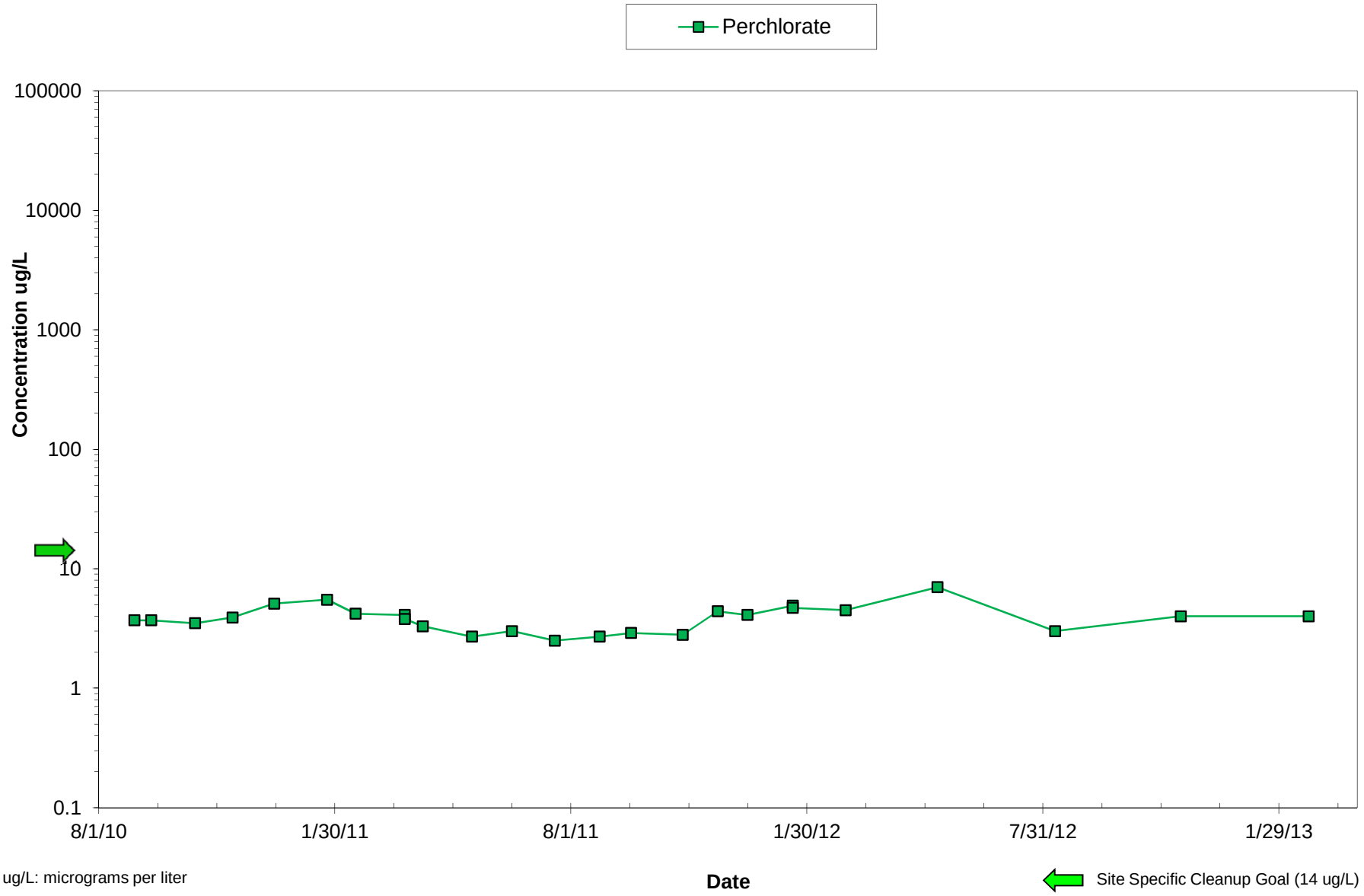
EPA MW-55A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

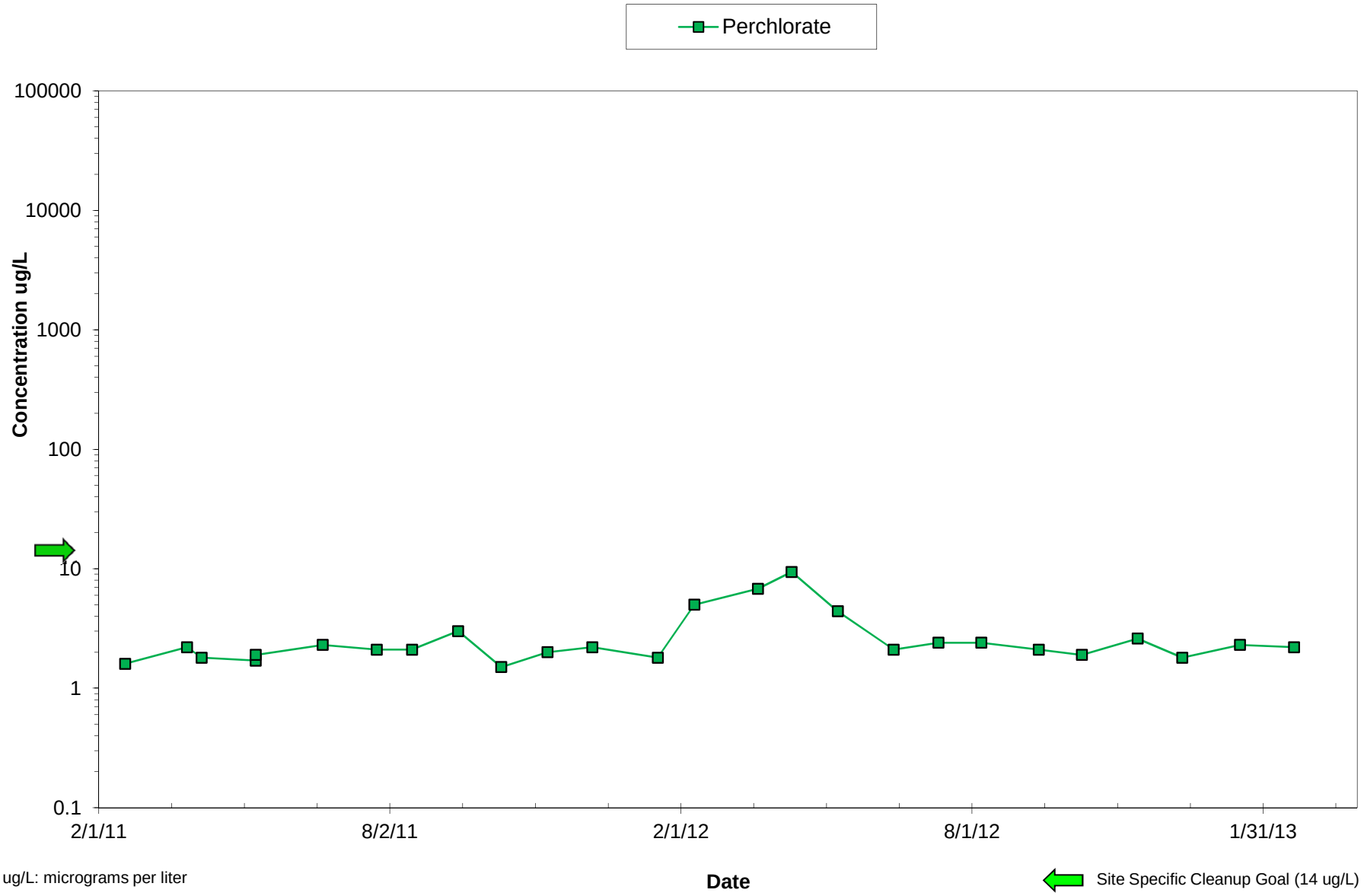
EPA MW-56A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

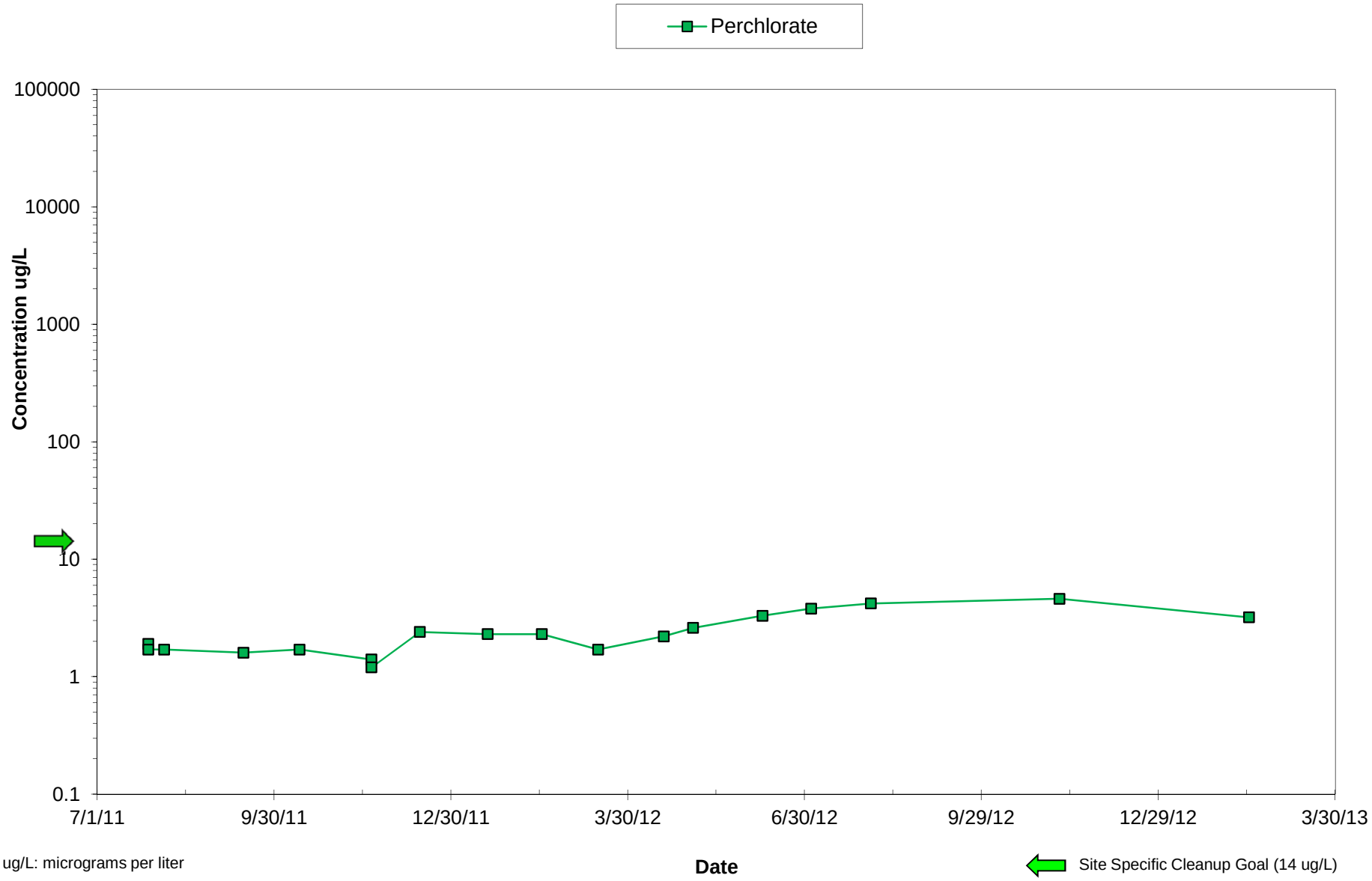
EPA MW-57A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

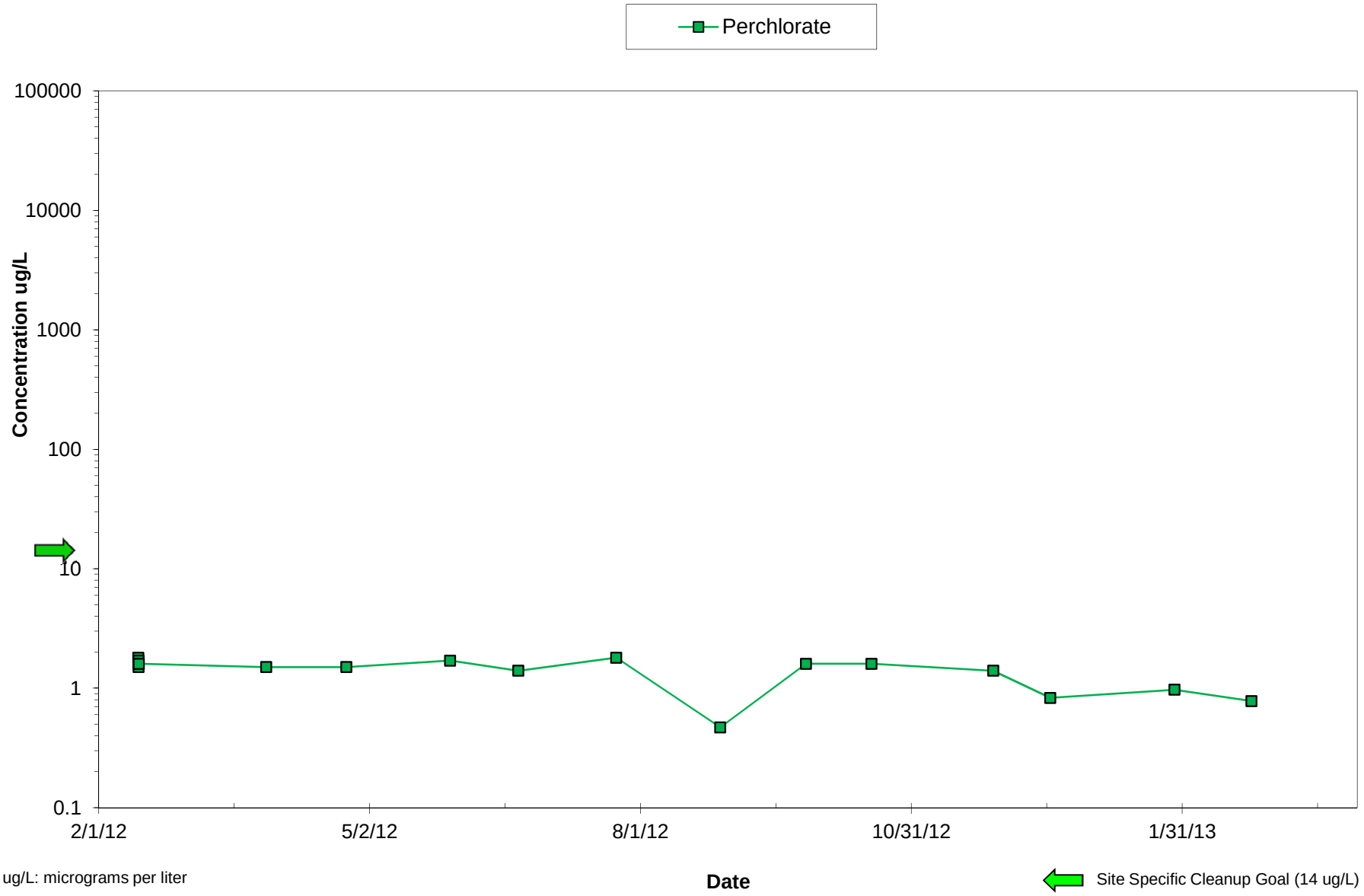
EPA MW-58A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

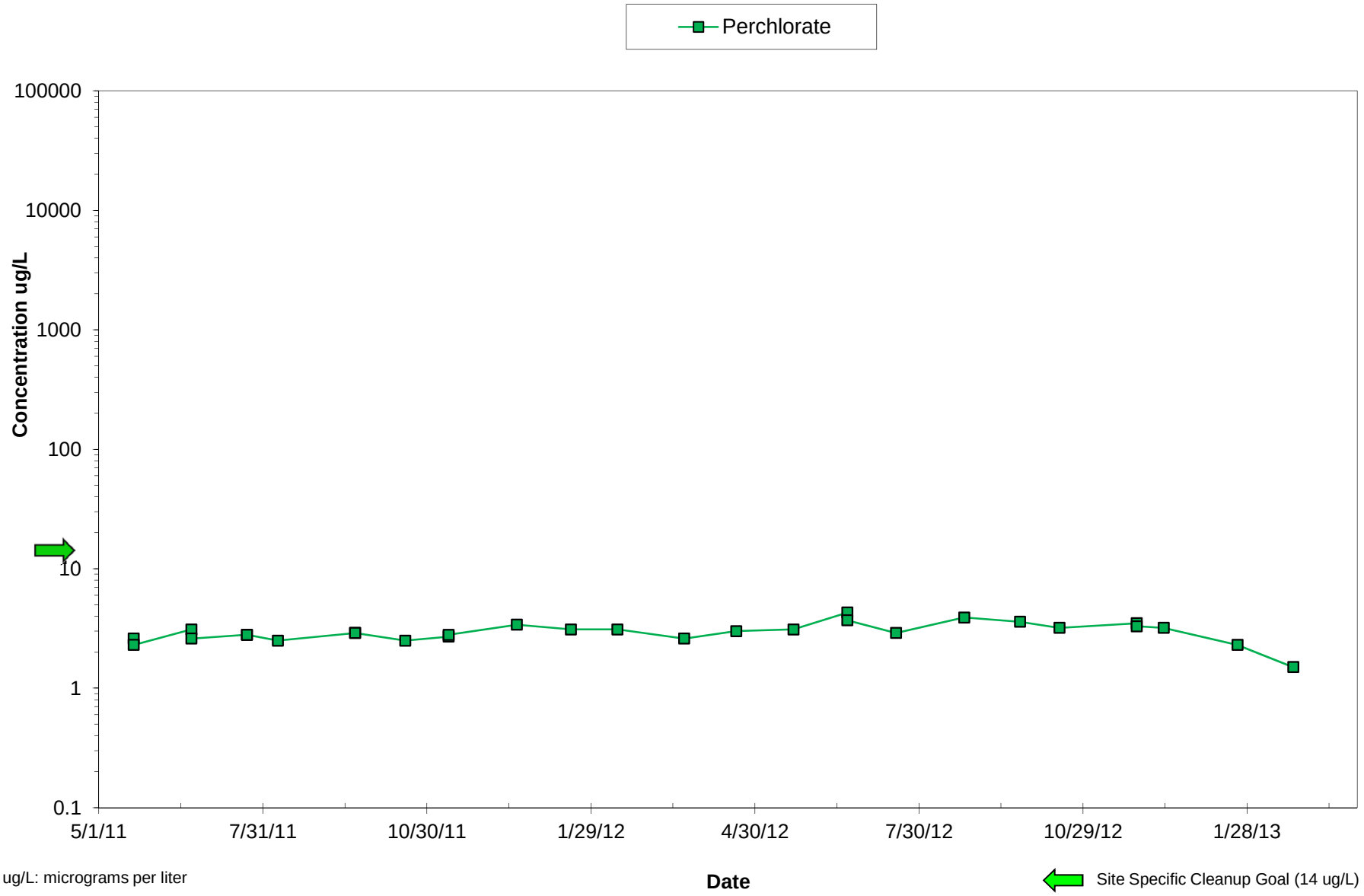
EPA MW-59A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

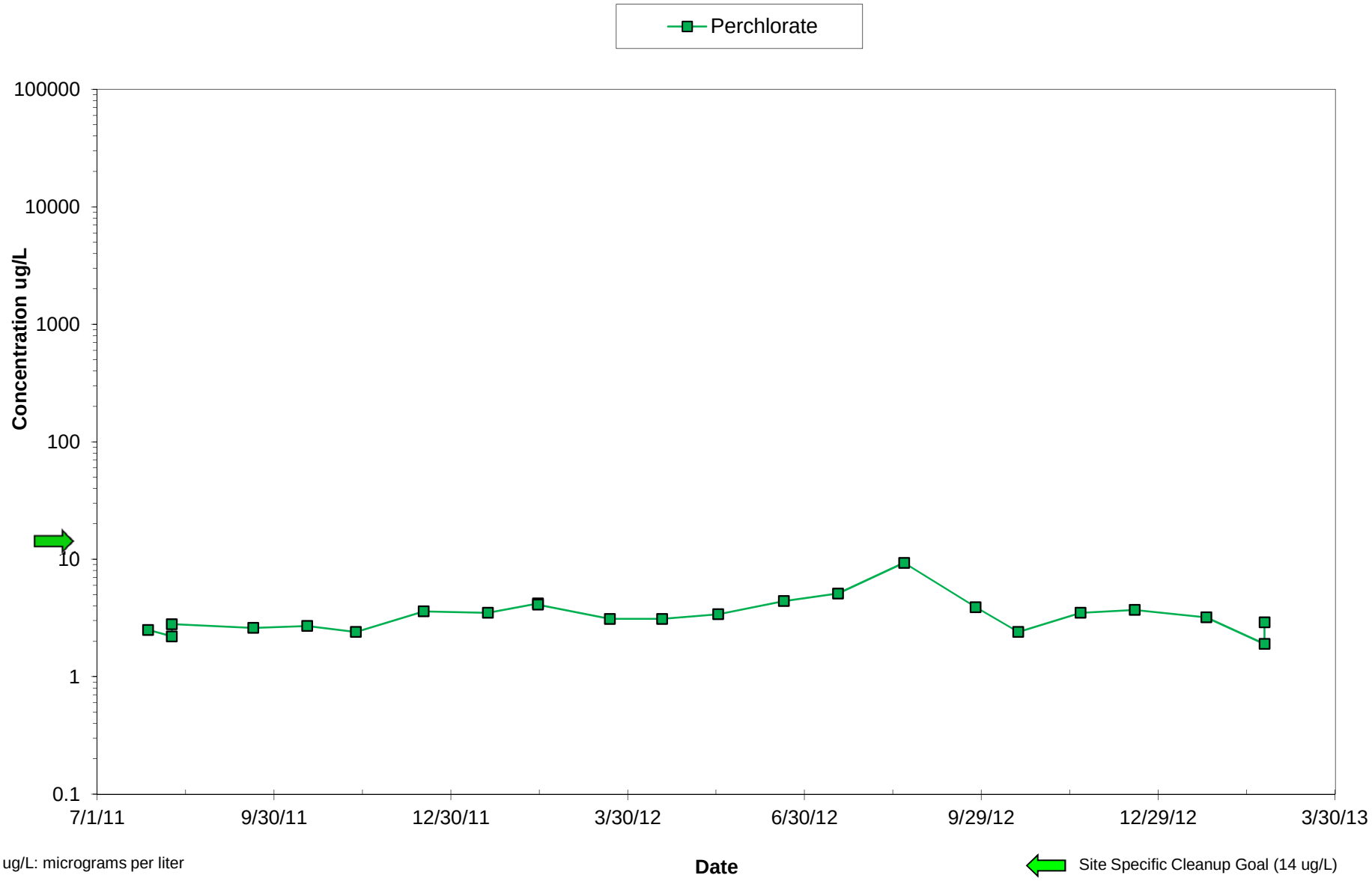
EPA MW-60A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

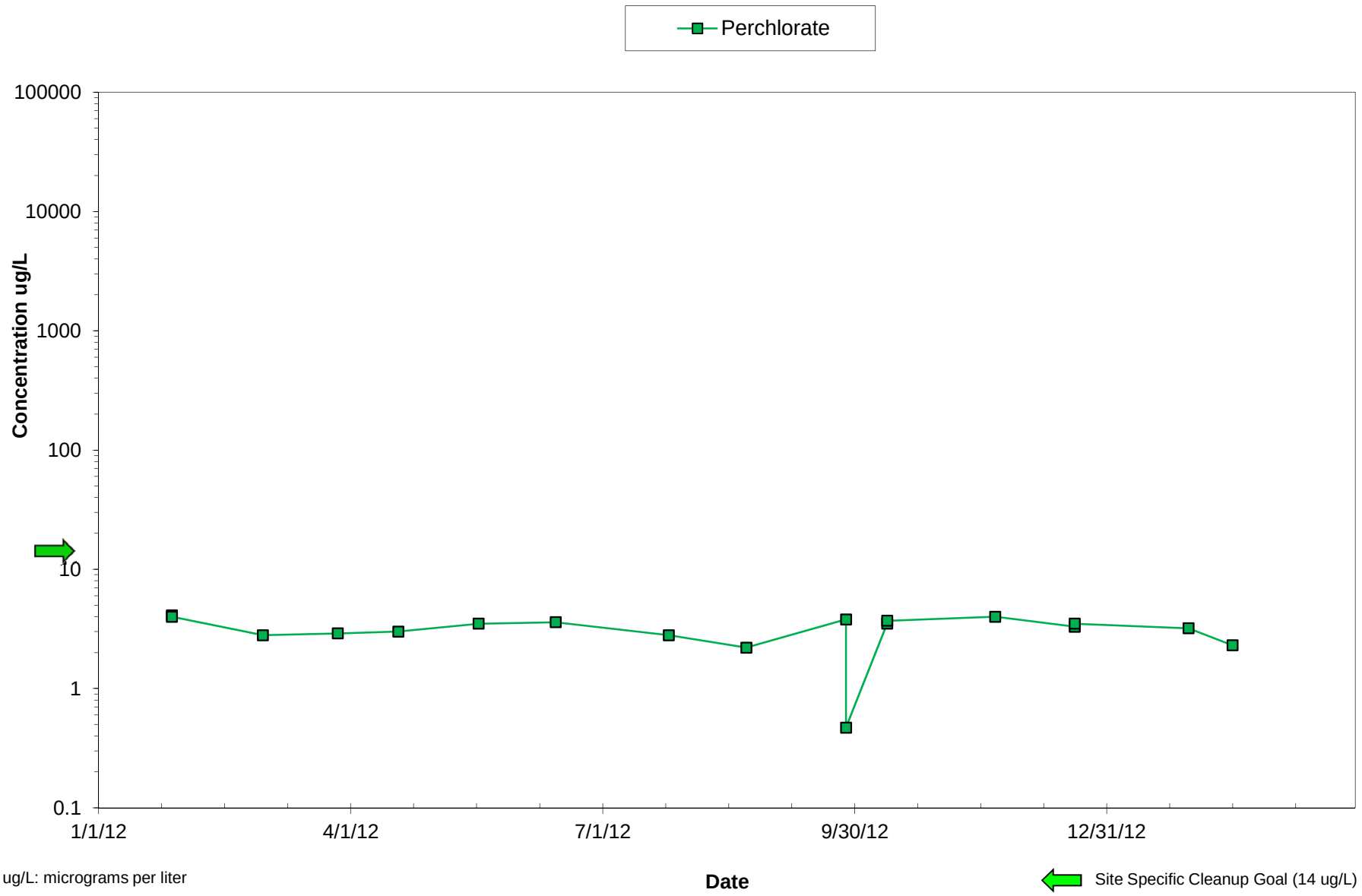
EPA MW-61A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

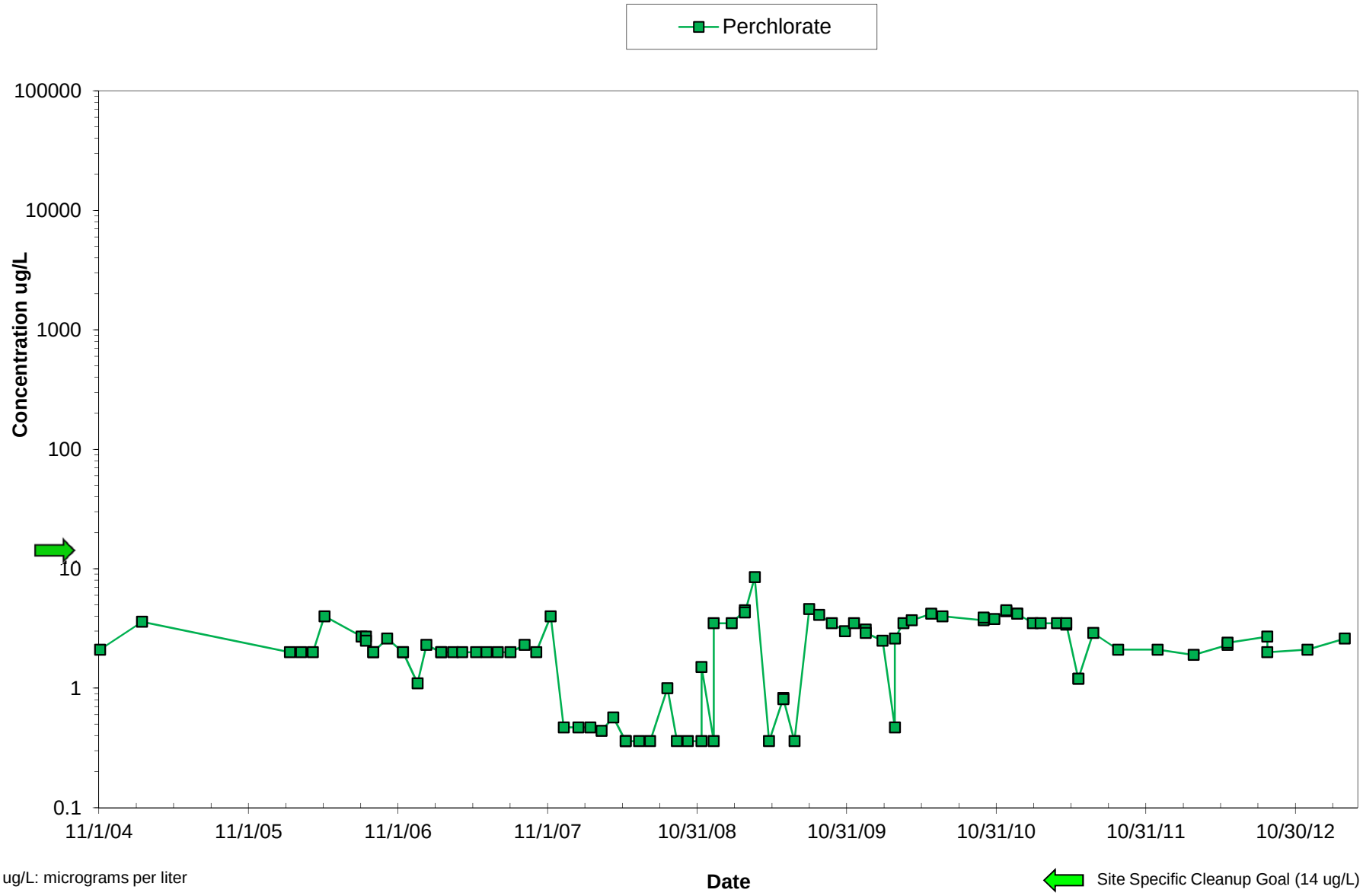
EPA MW-62A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

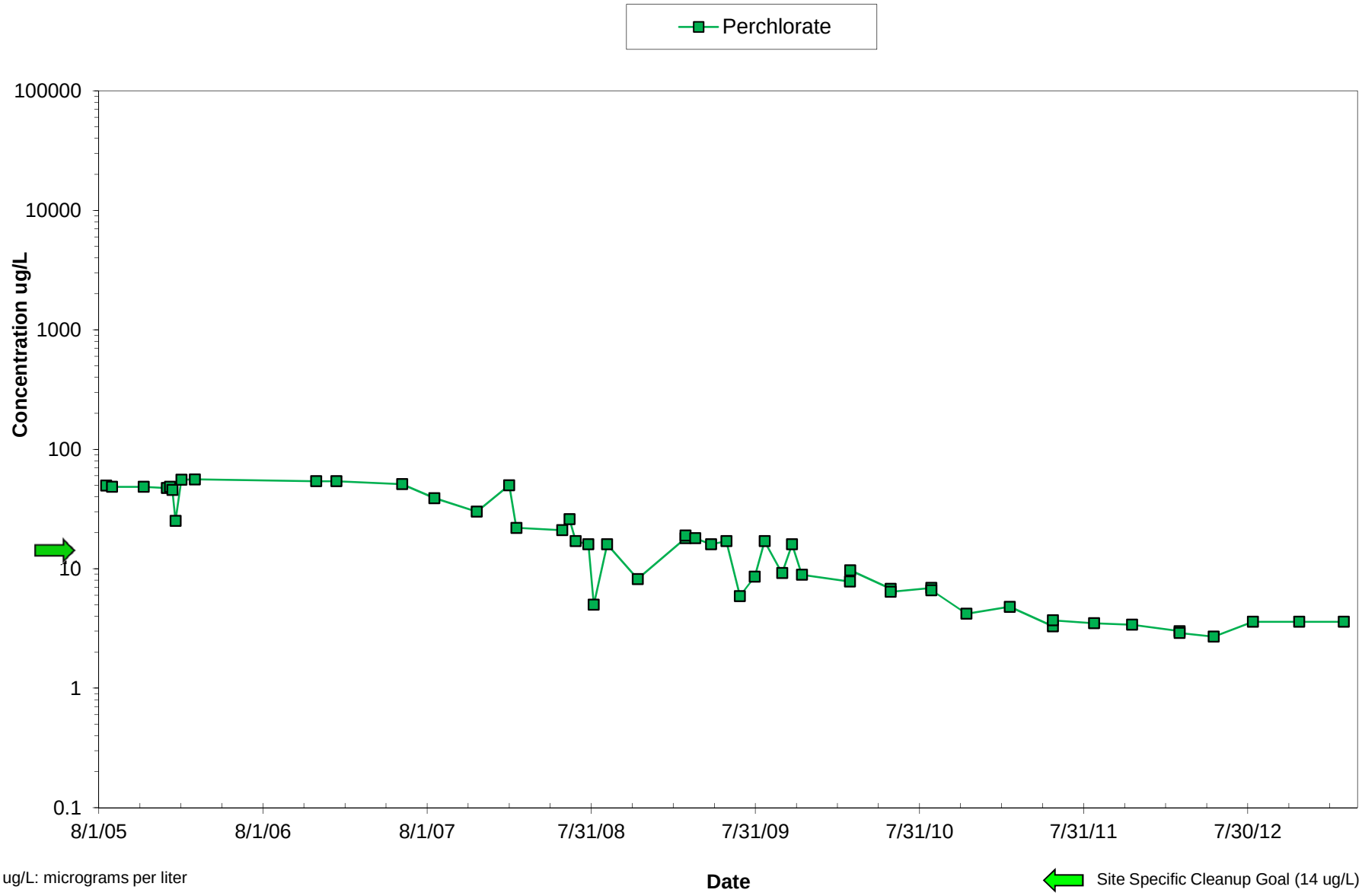
IR-34B
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

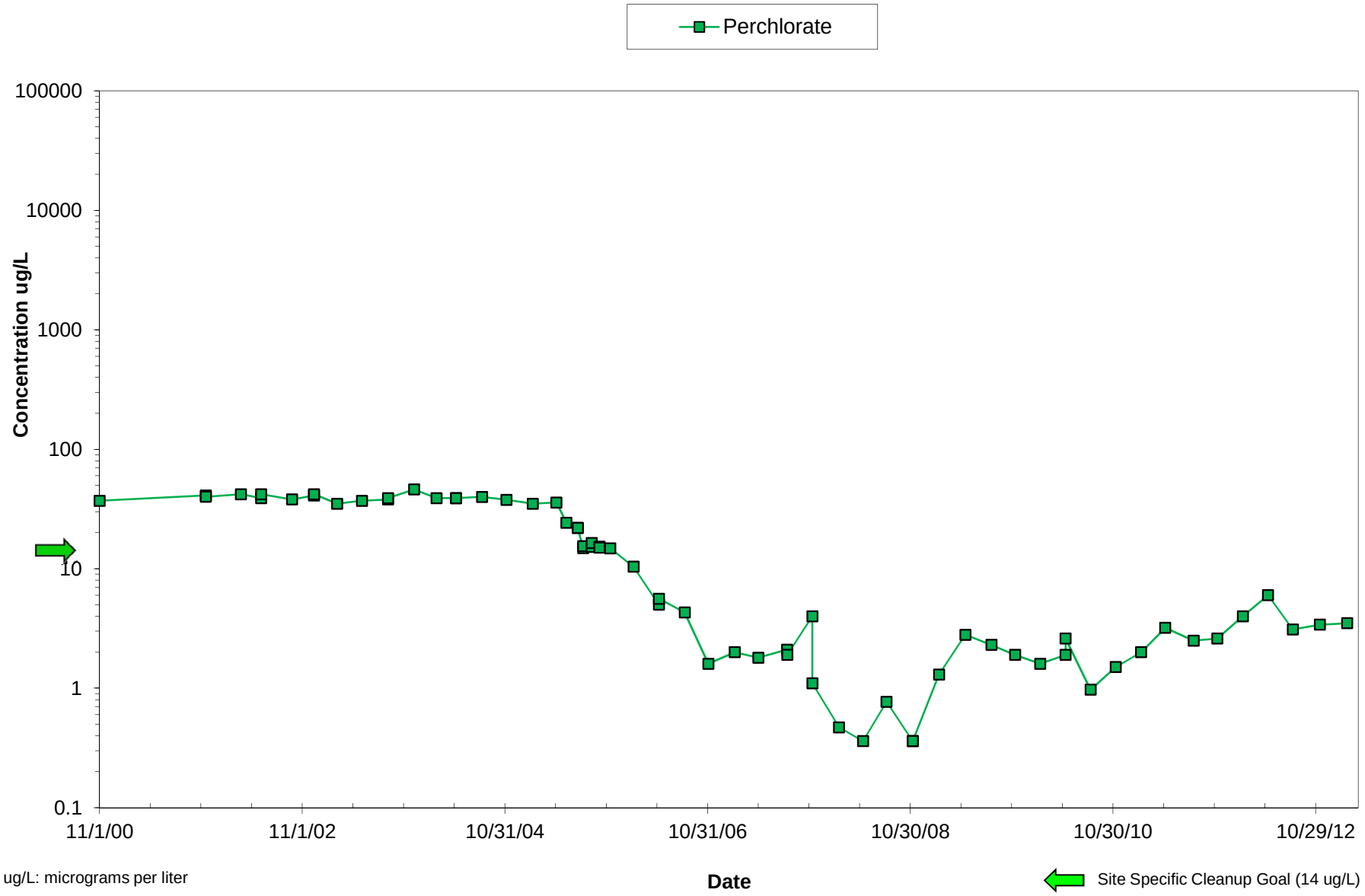
IRZ MW-C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

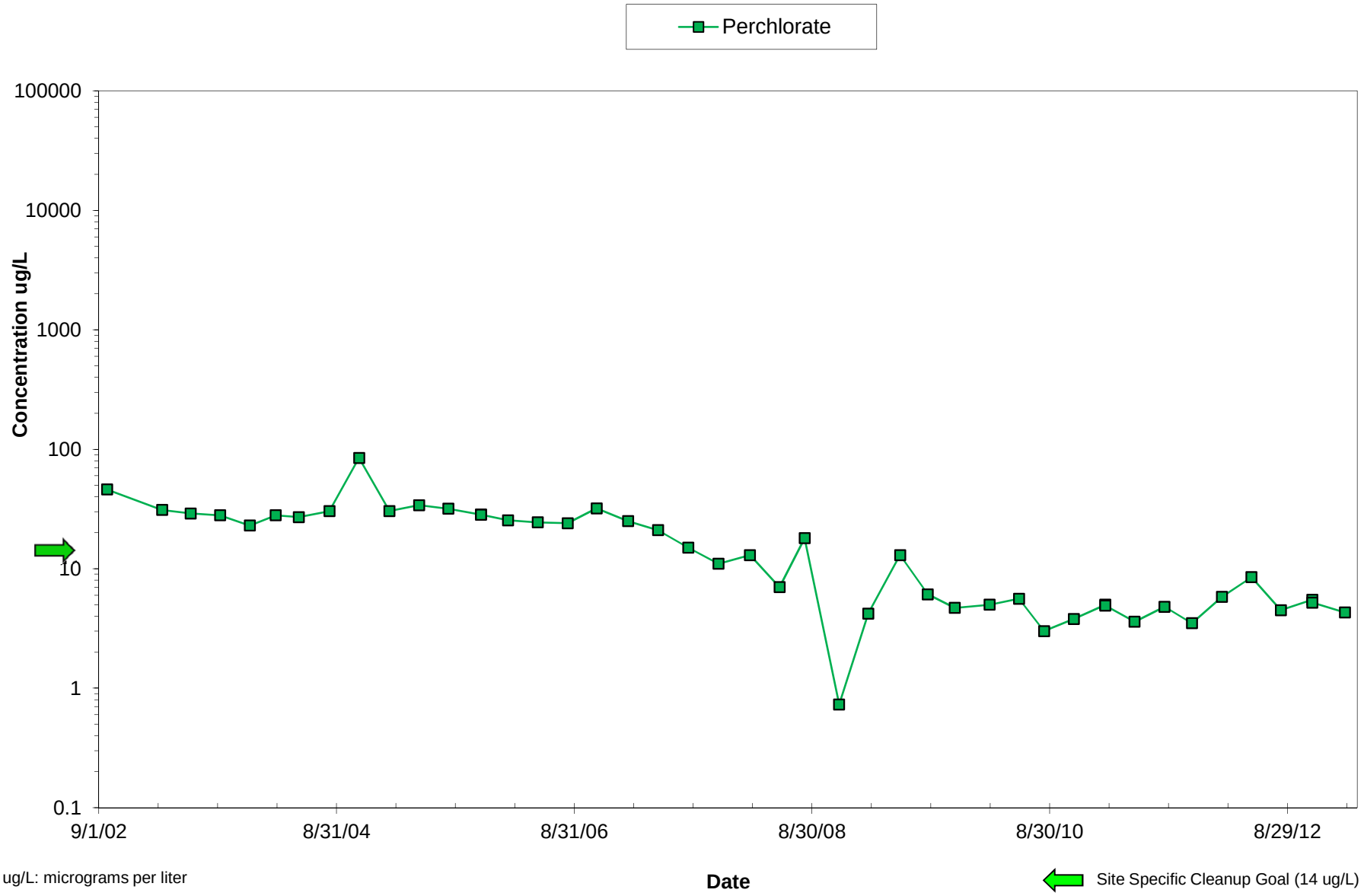
MW-01
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

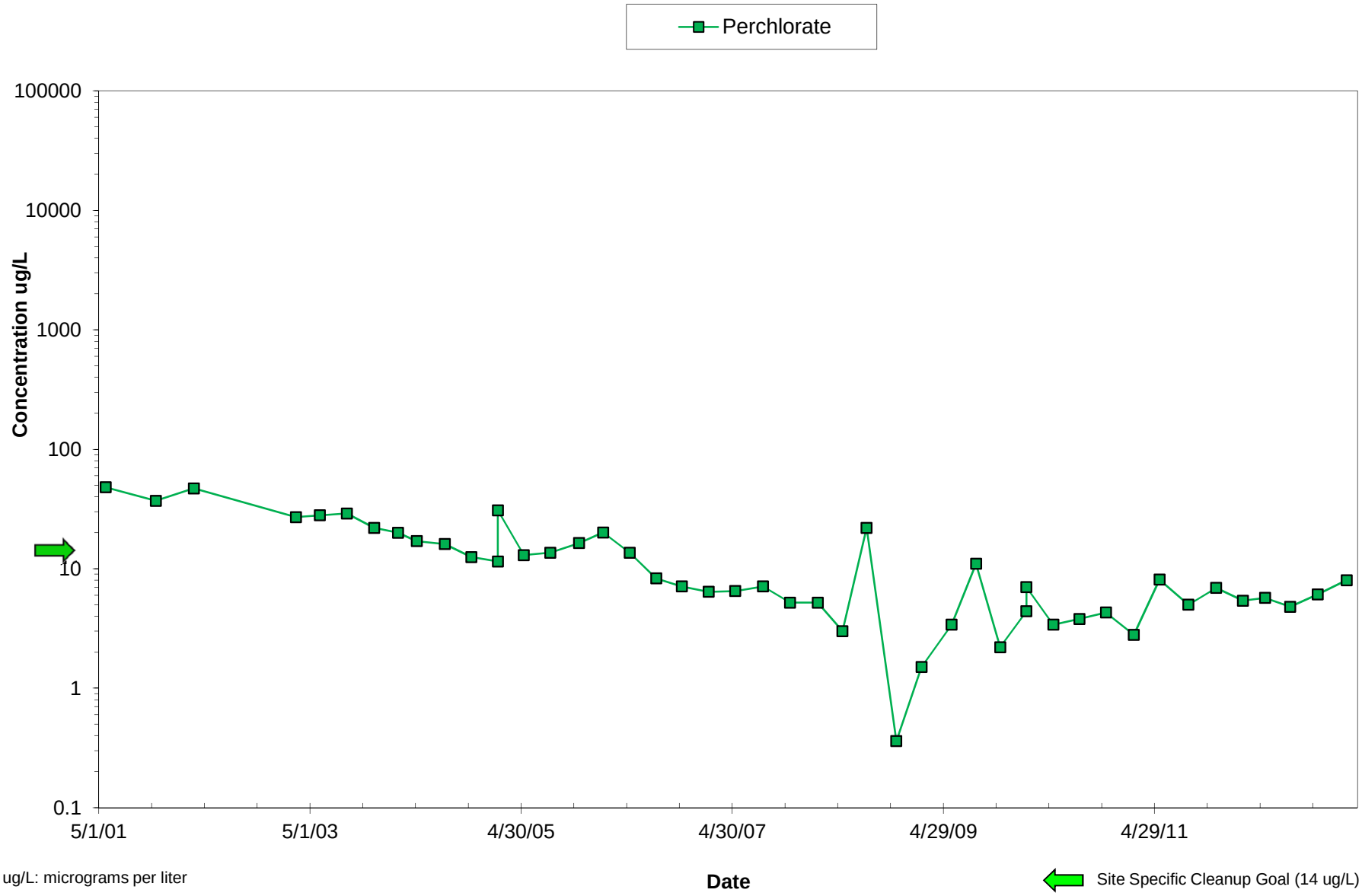
MW-02
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

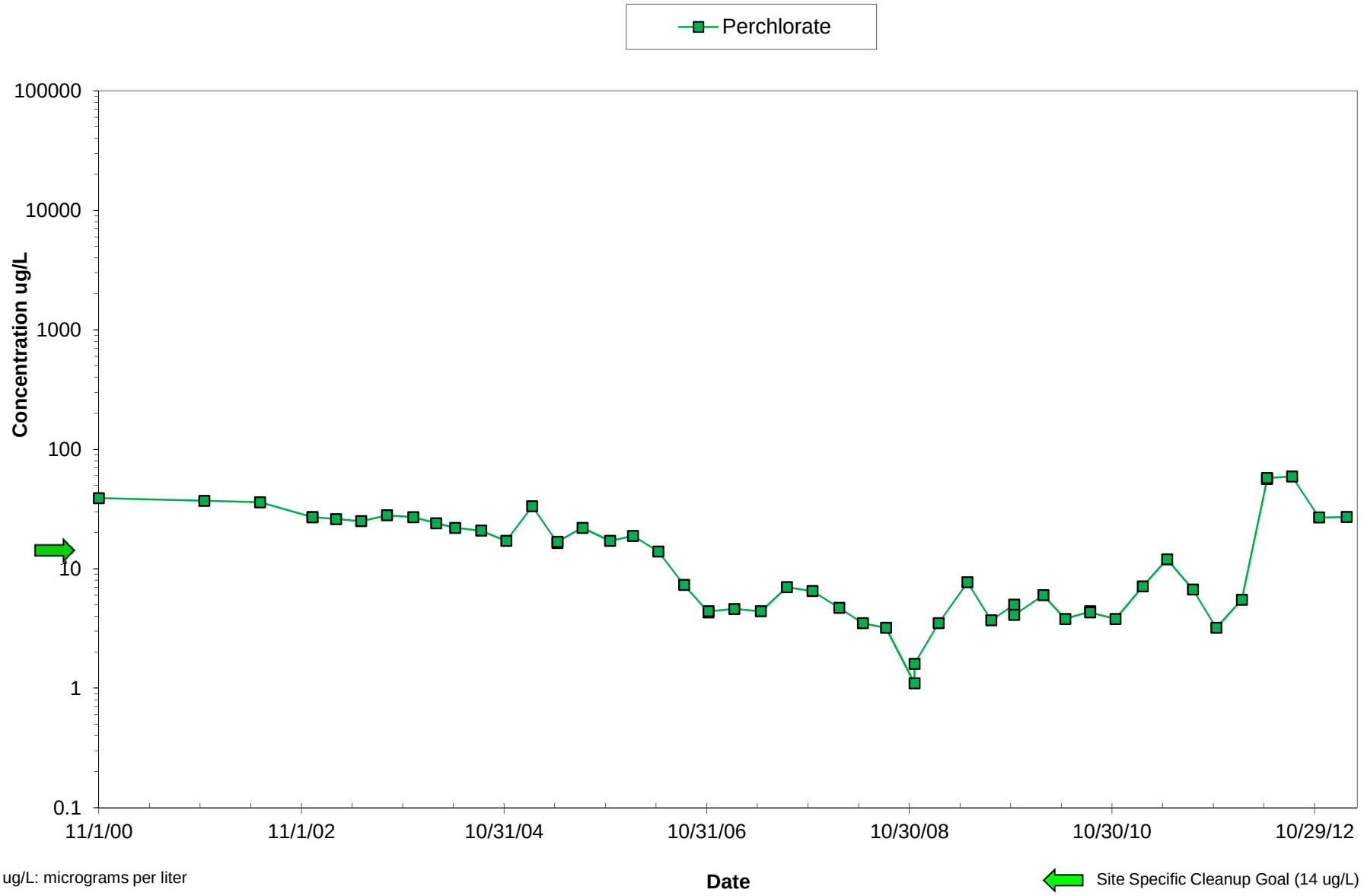
MW-03
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

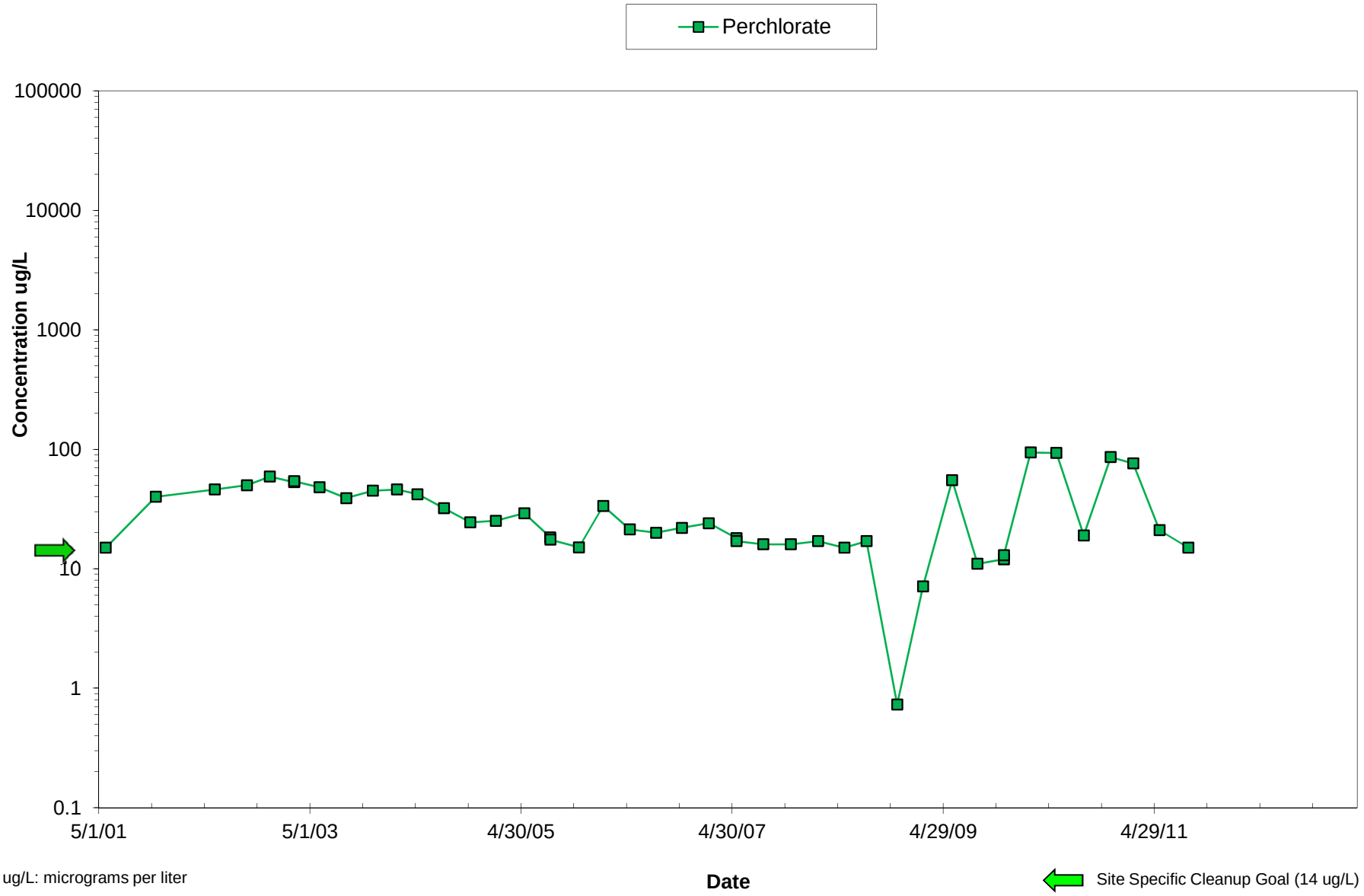
MW-04
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

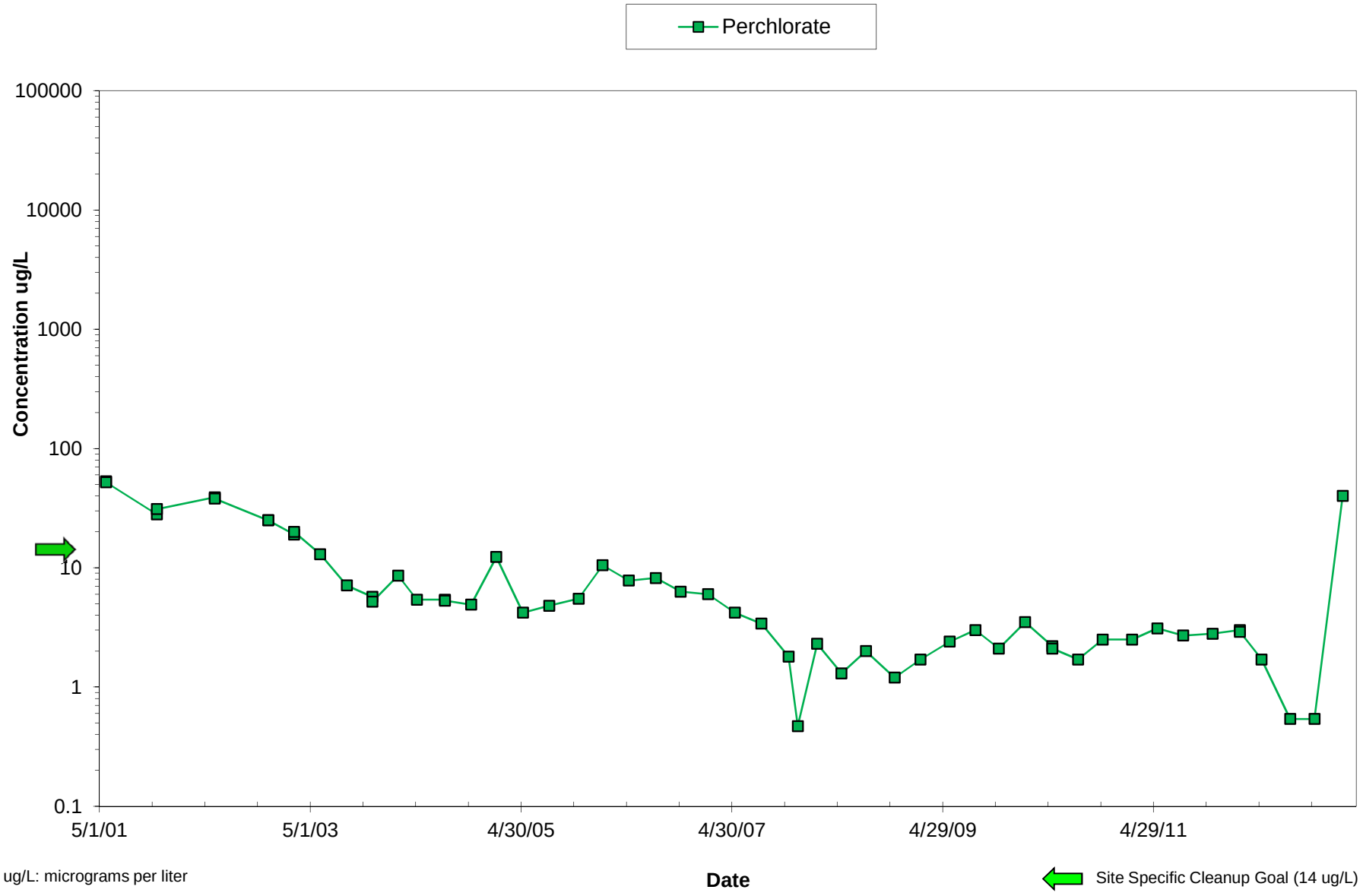
MW-07
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

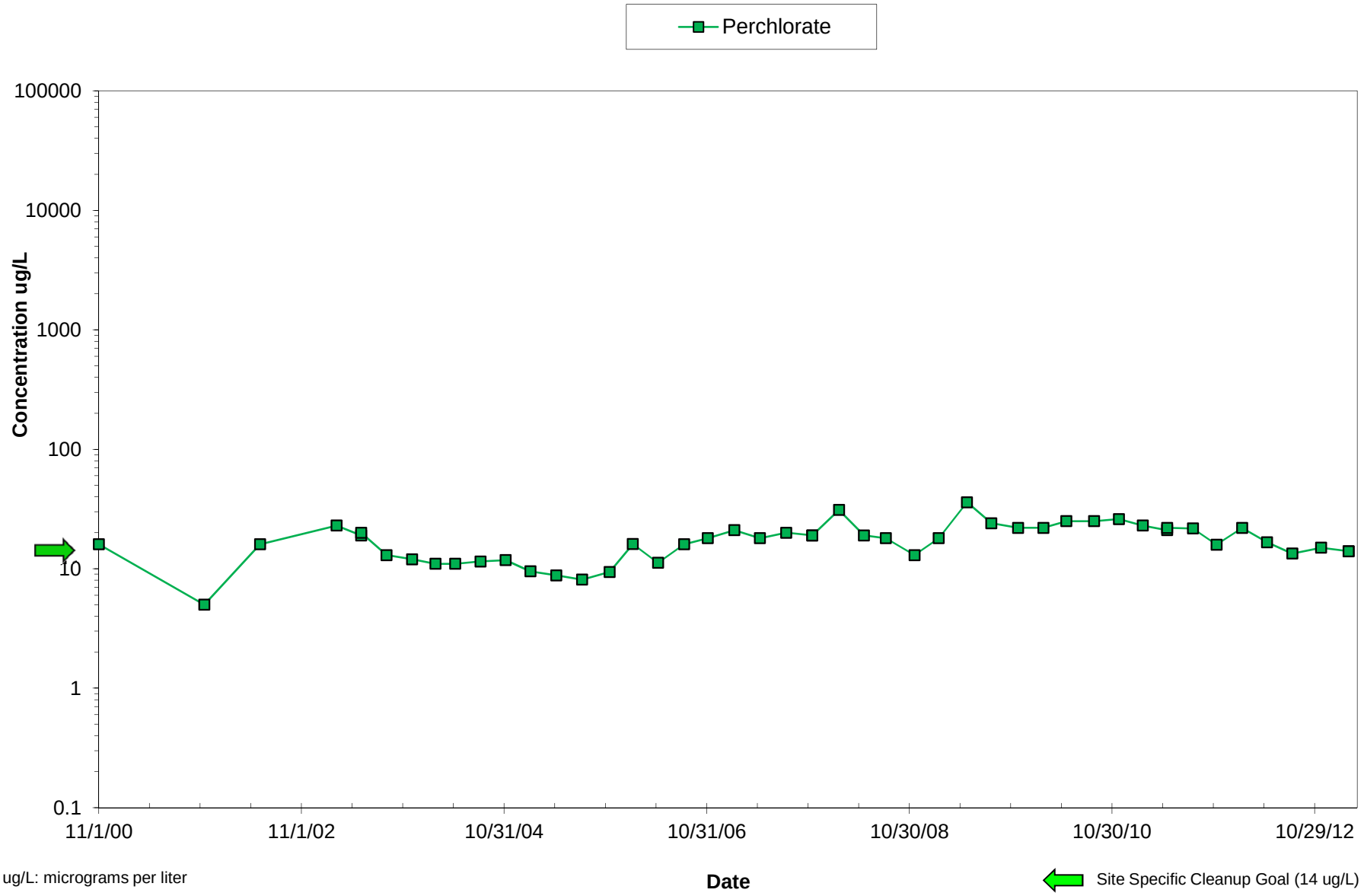
MW-08
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

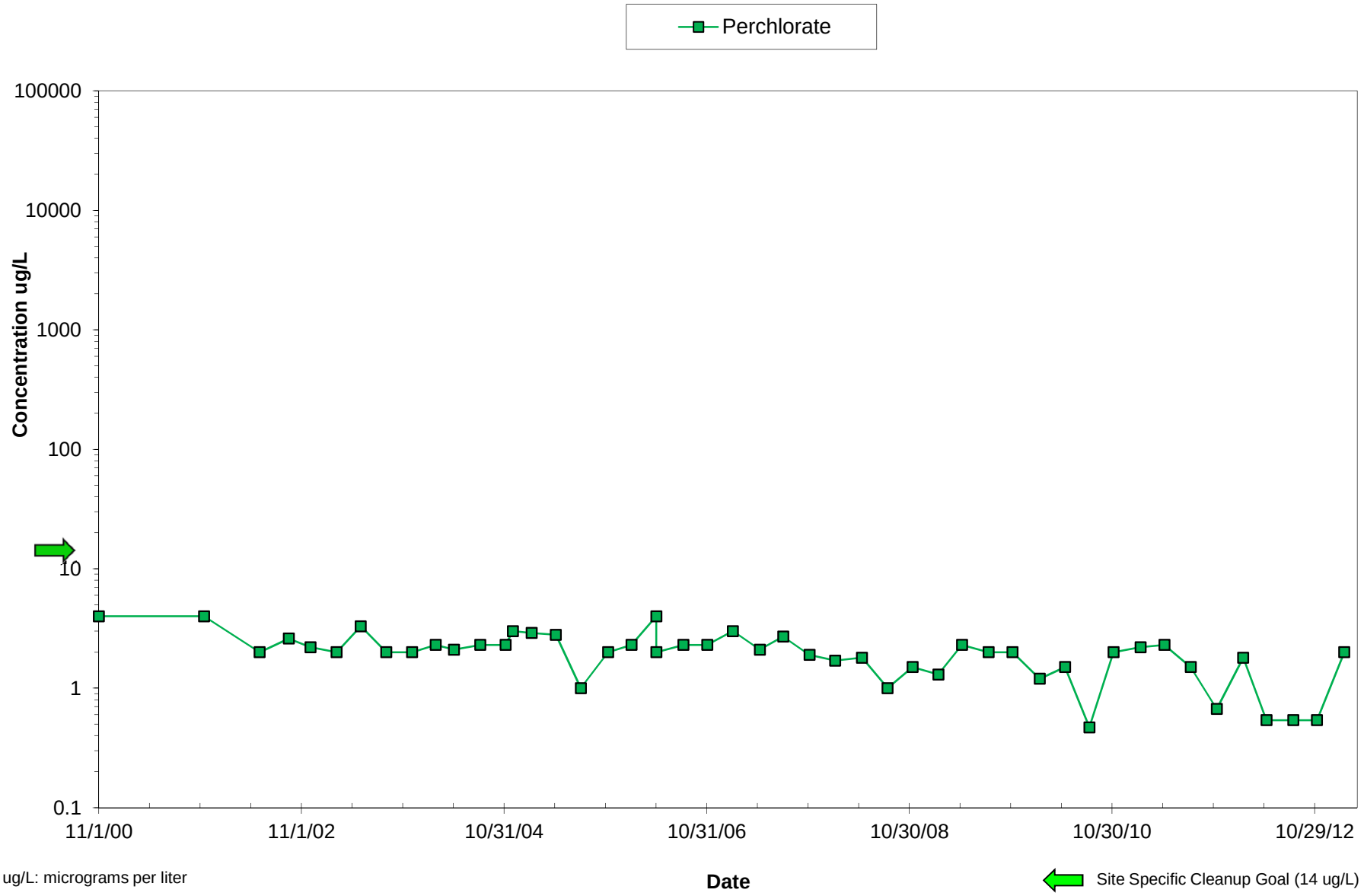
MW-09
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

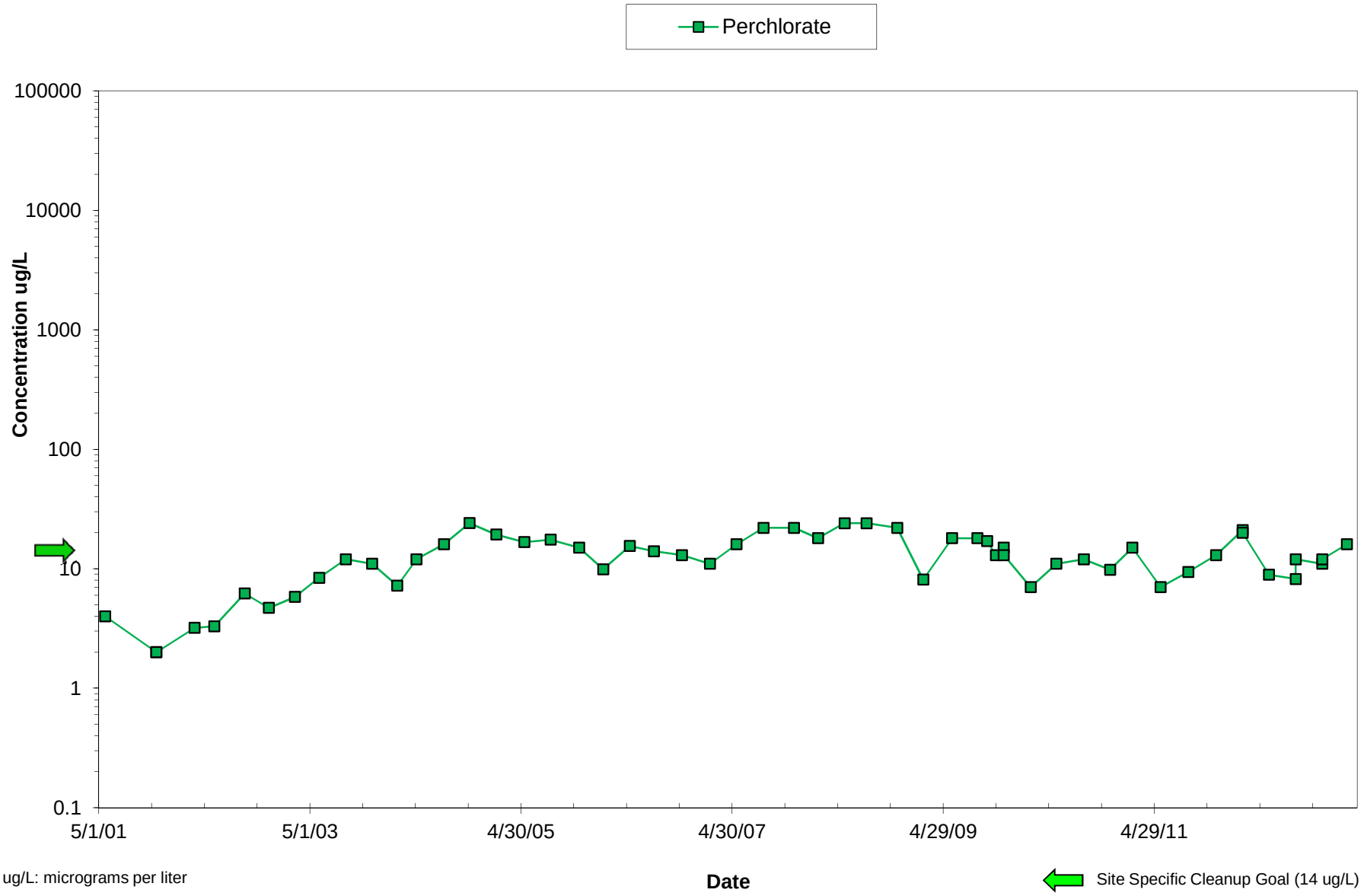
MW-11
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

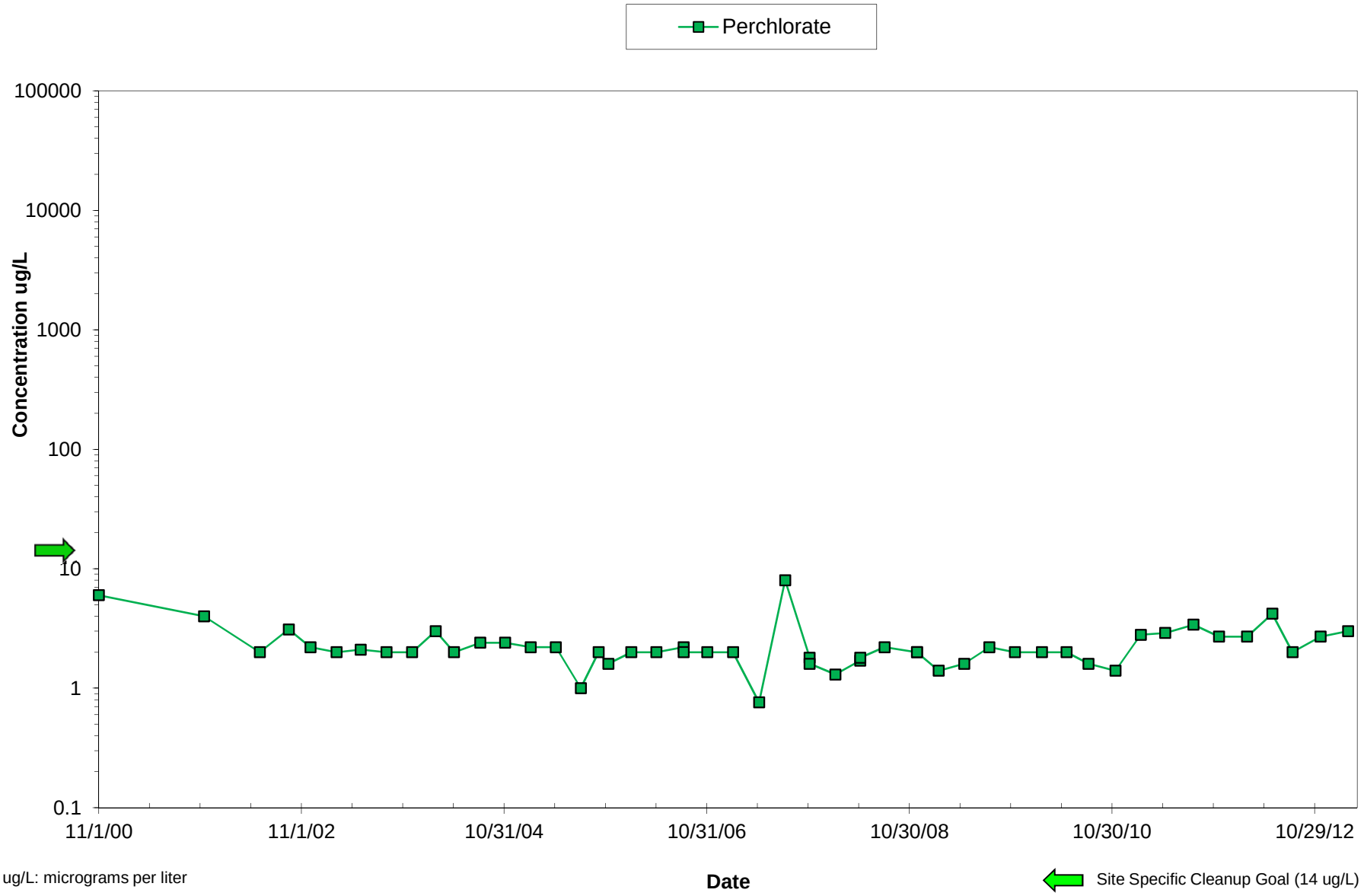
MW-12
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

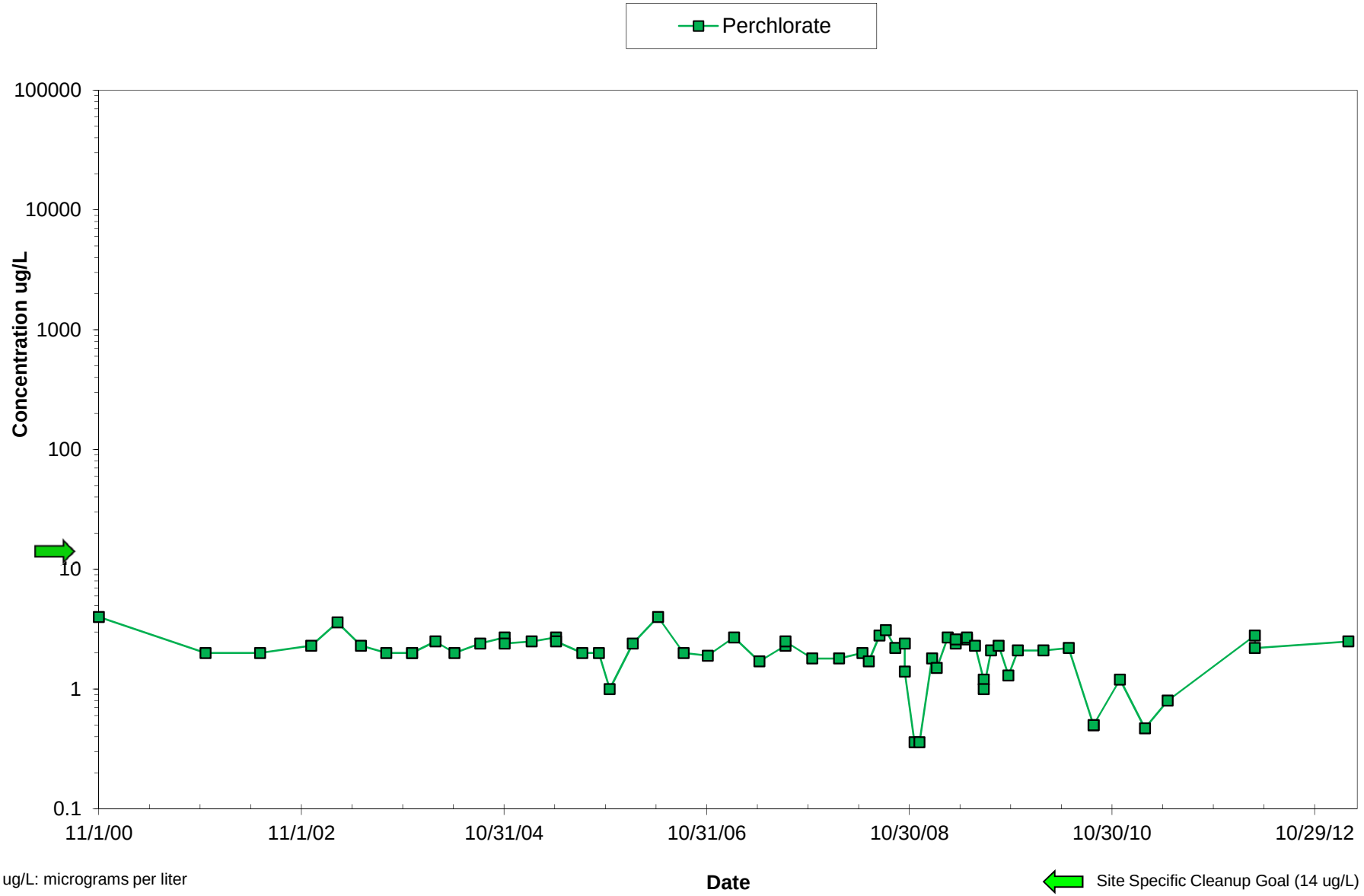
MW-13
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

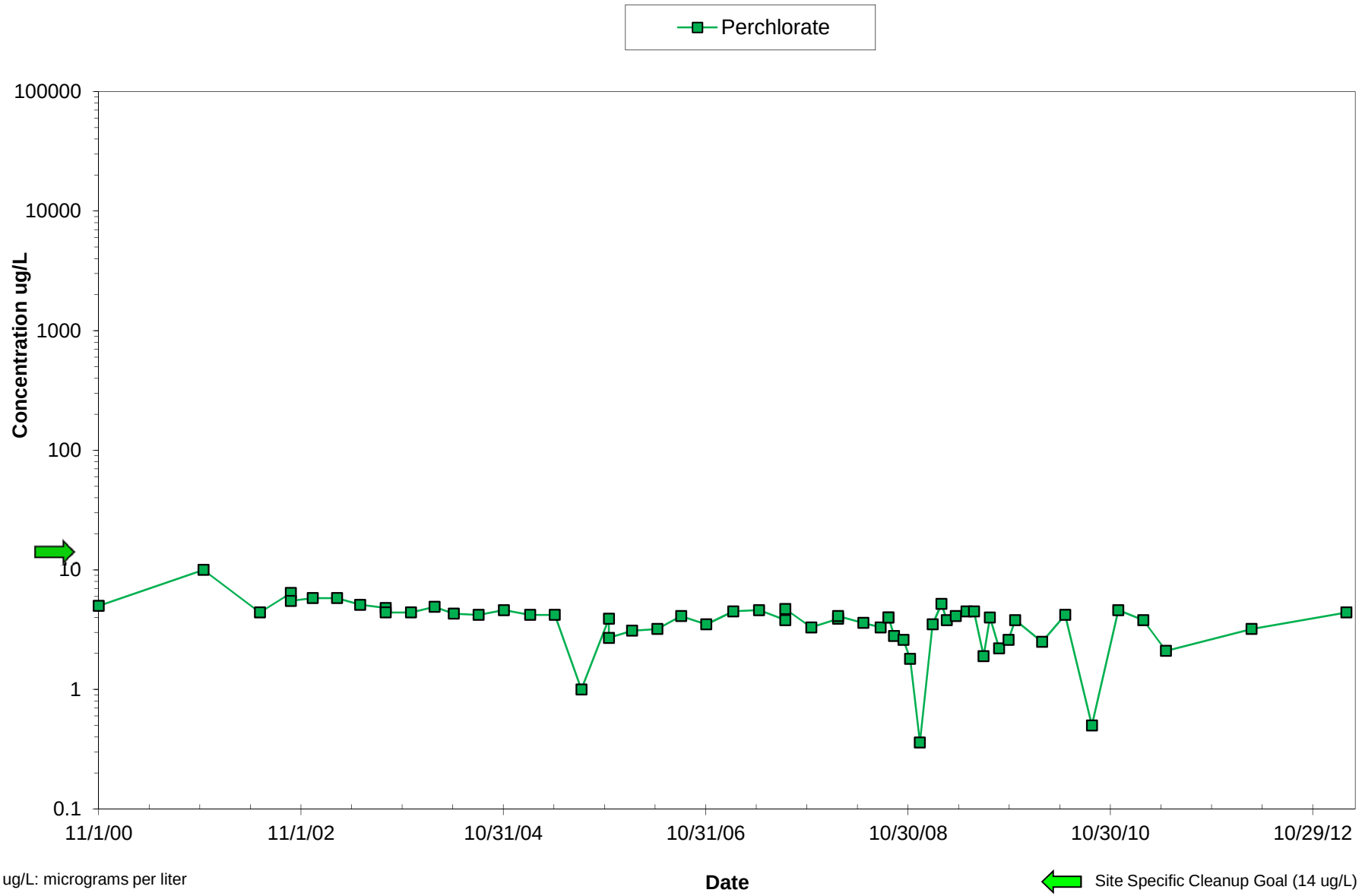
MW-15
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

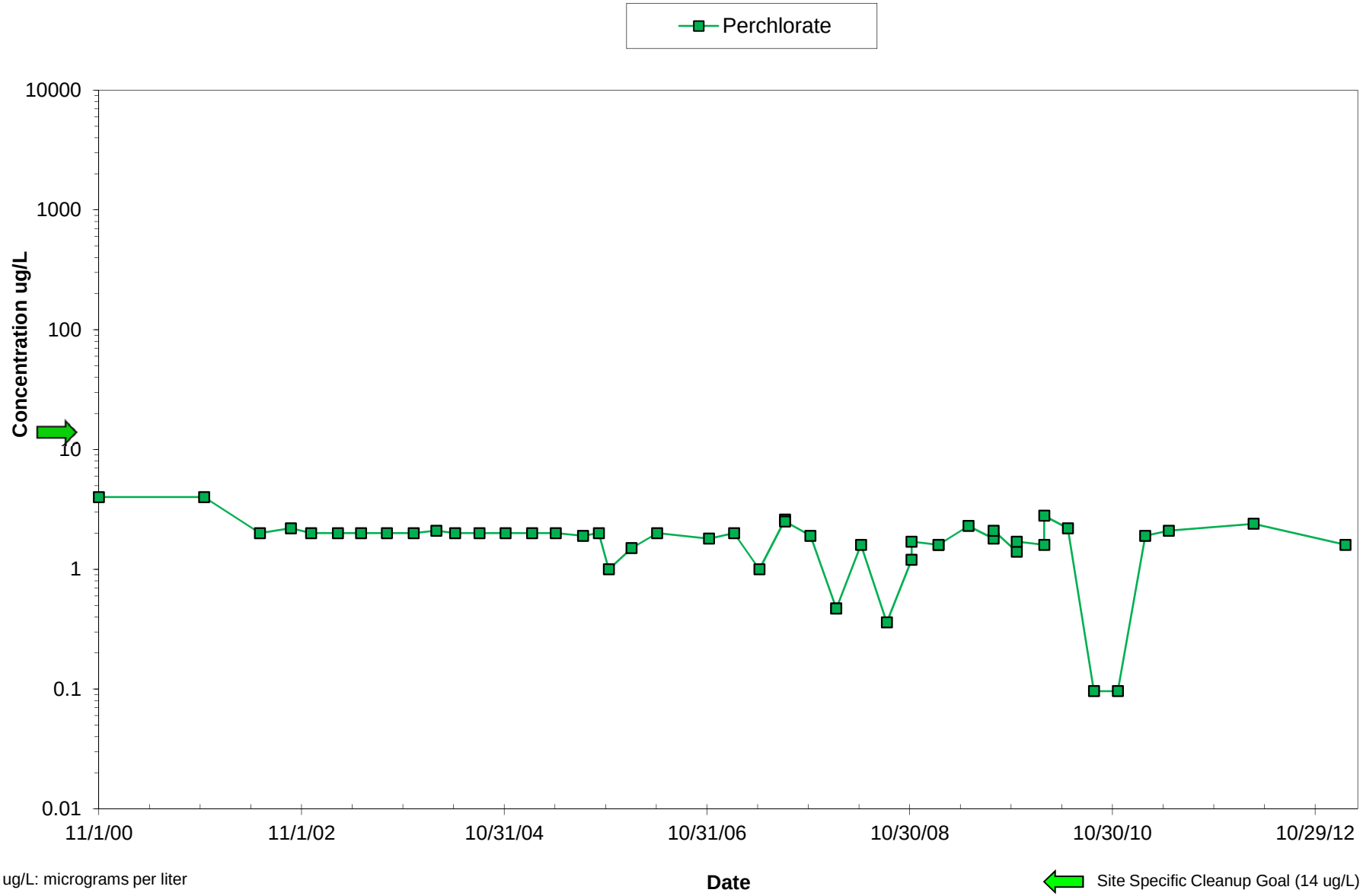
MW-16
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

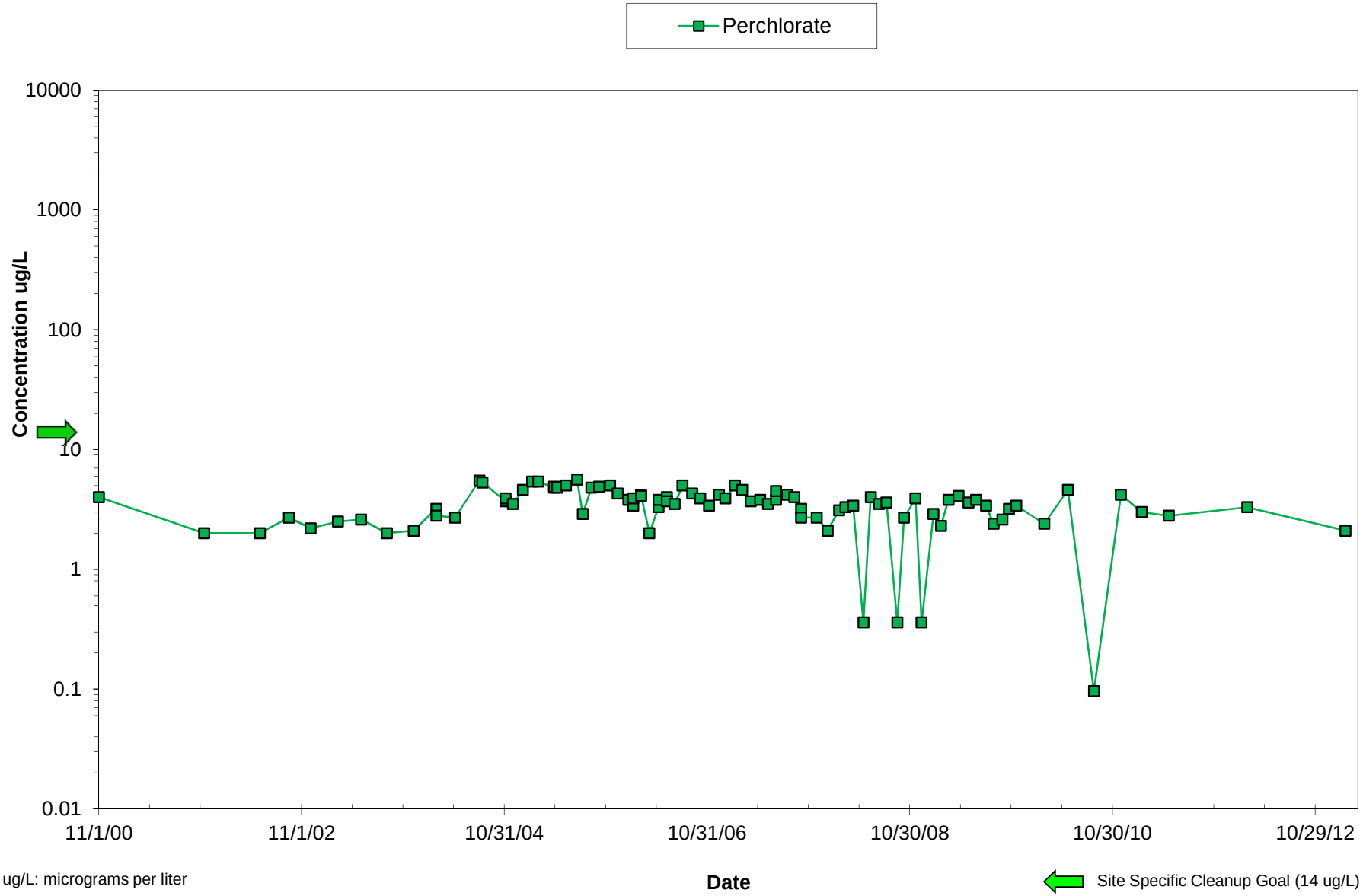
MW-17
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

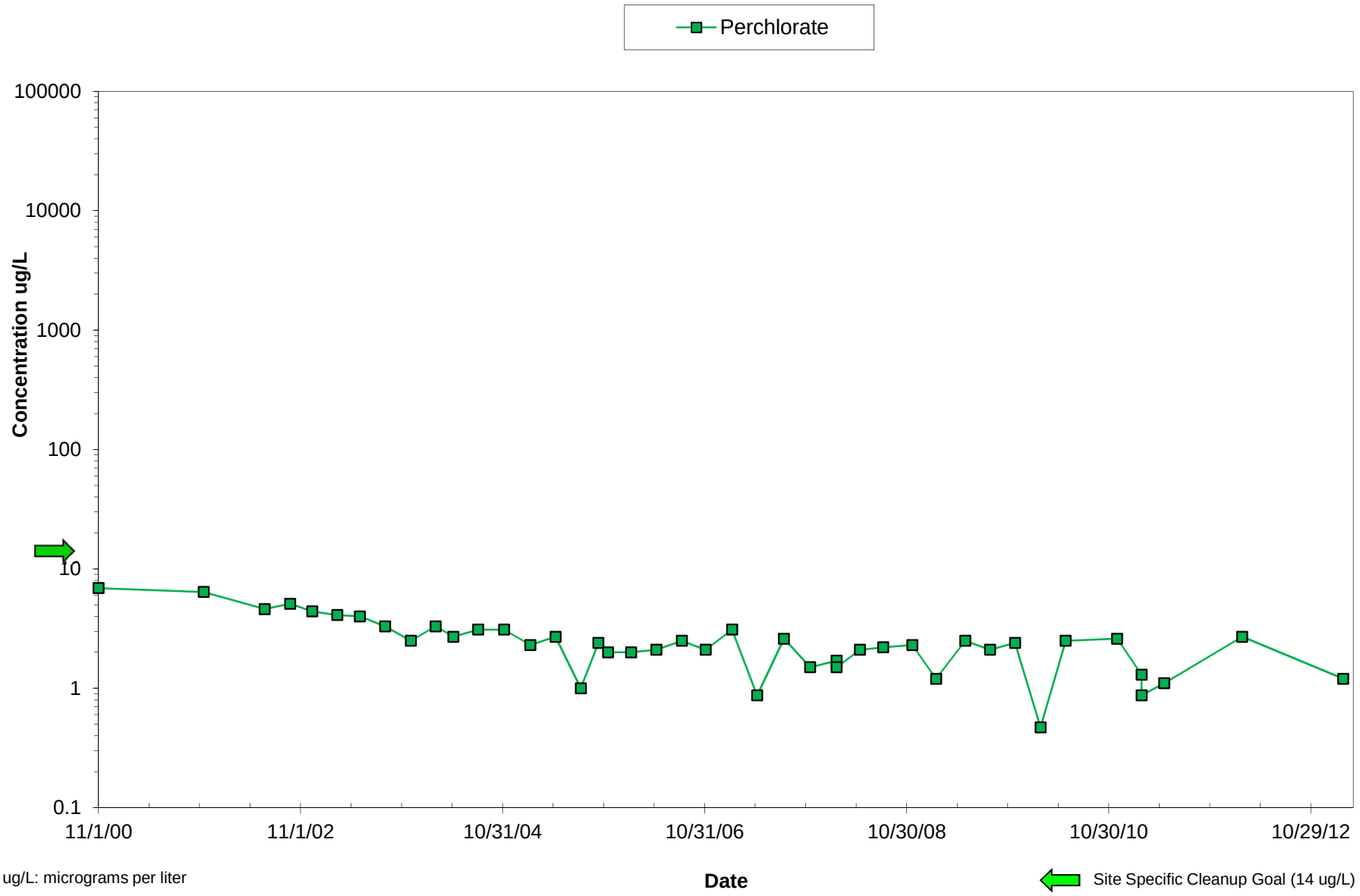
MW-18
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

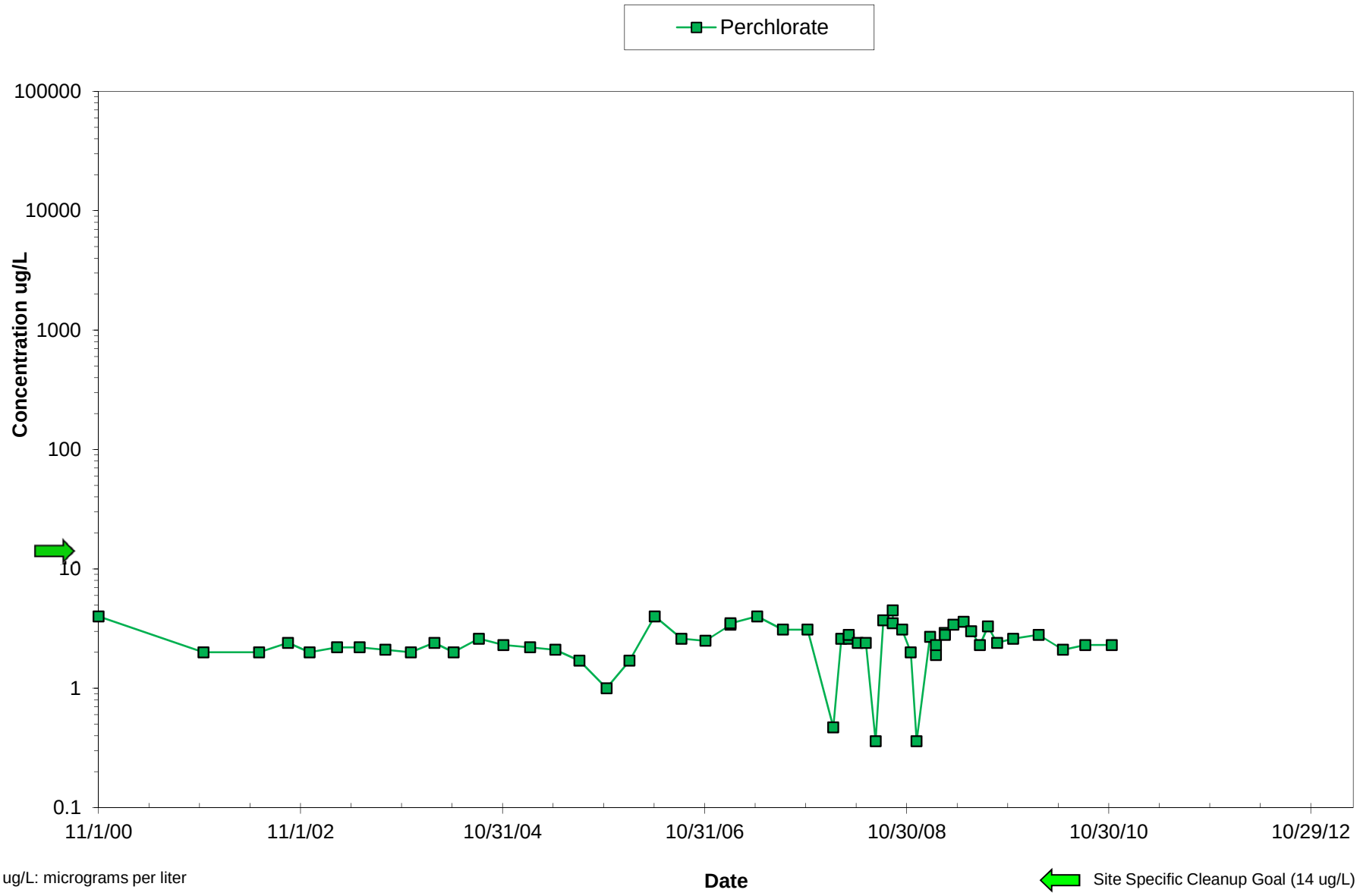
MW-19
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

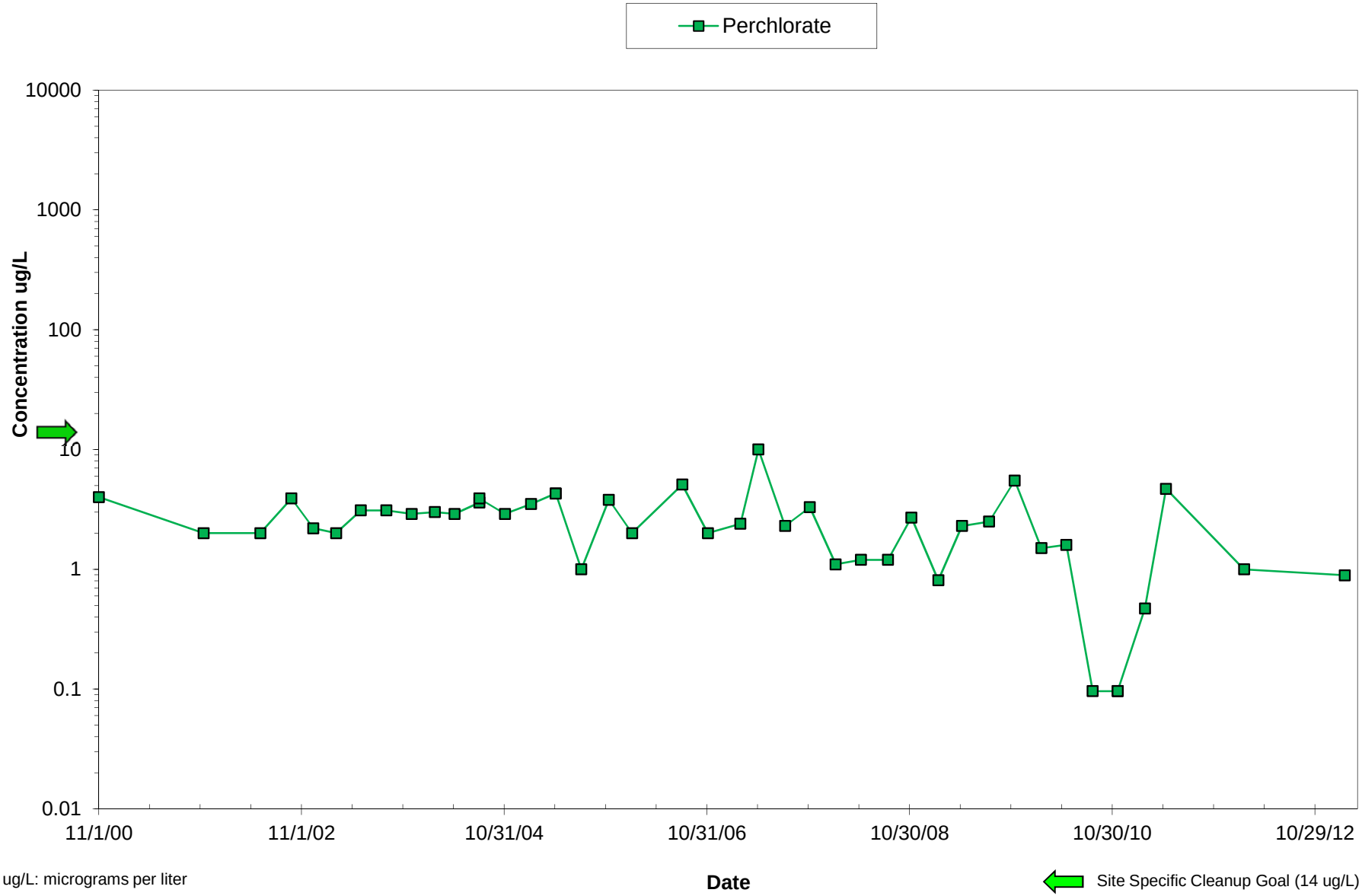
MW-22
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

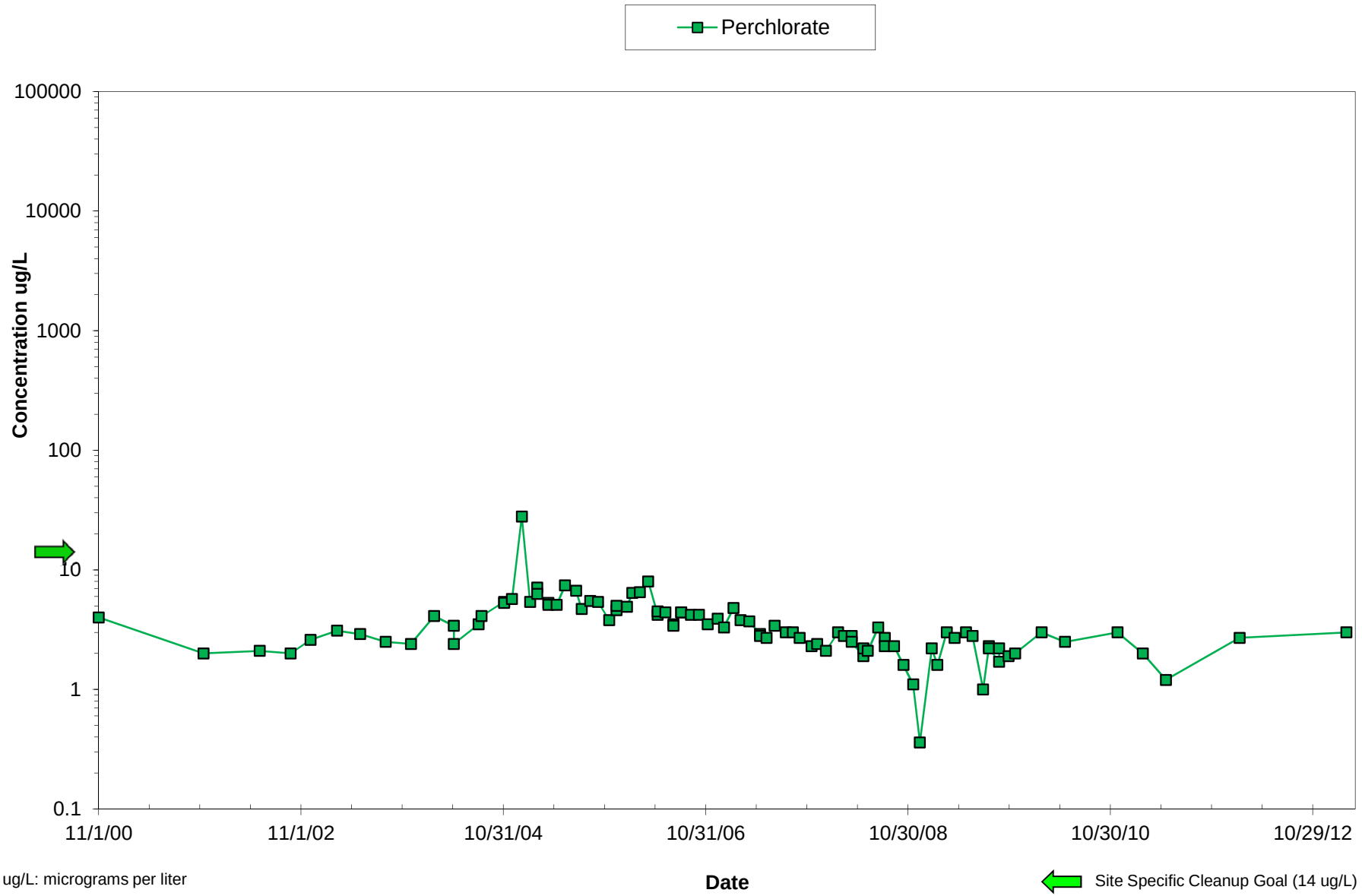
MW-24
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

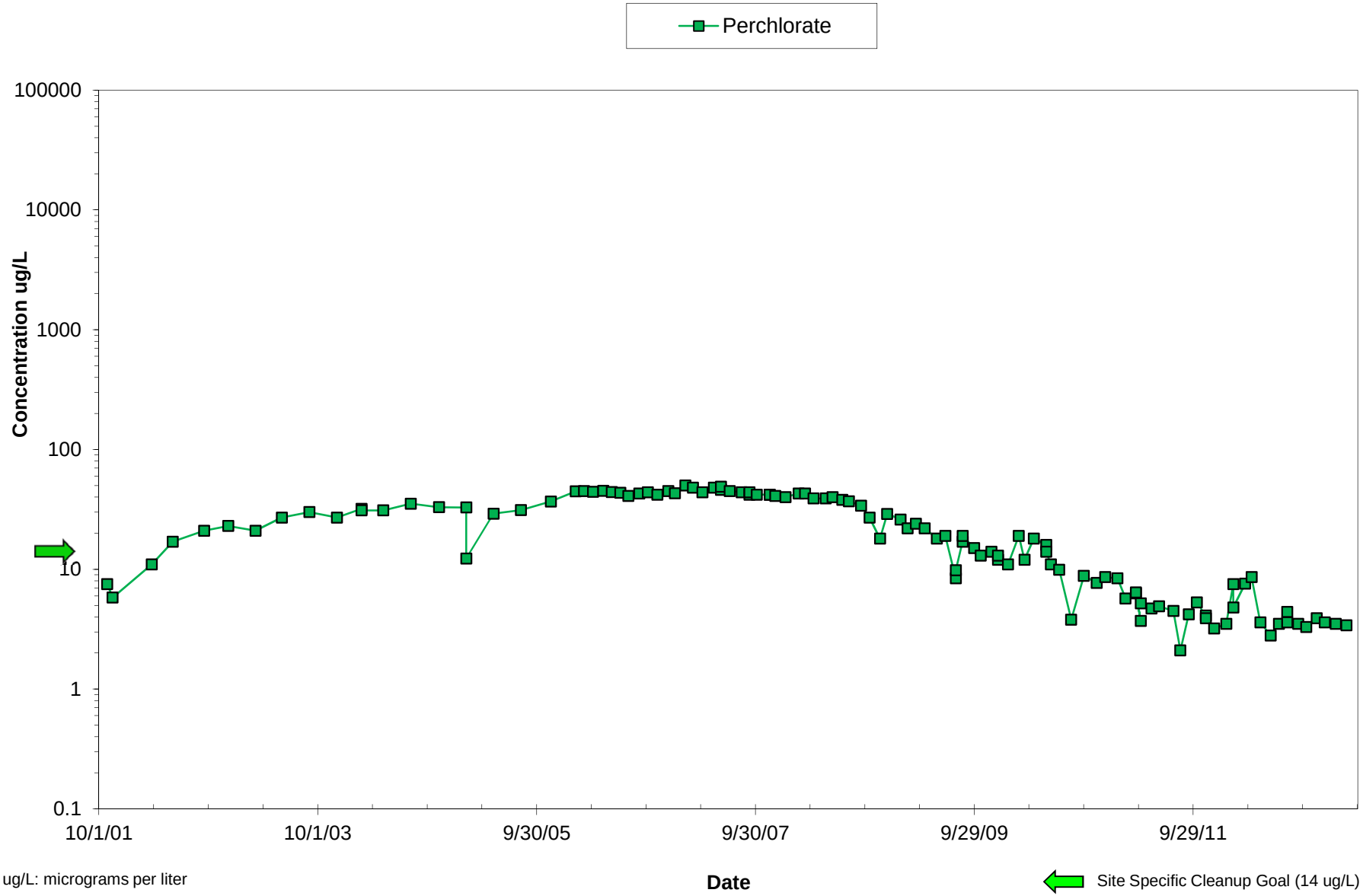
MW-25
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

MW-27
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

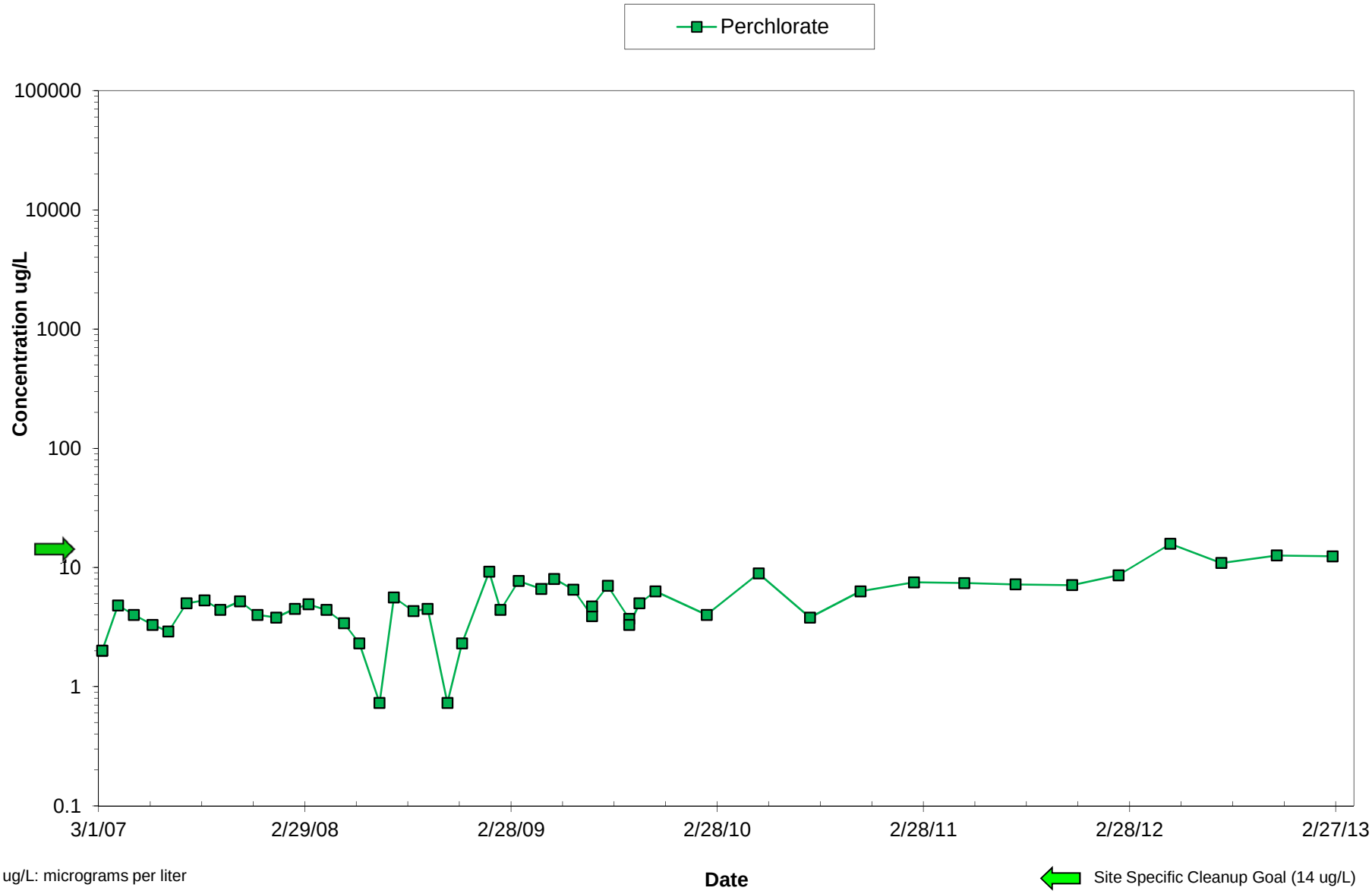
MATRIXNEWORLD
Enabling Progress

OW-B
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona

ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

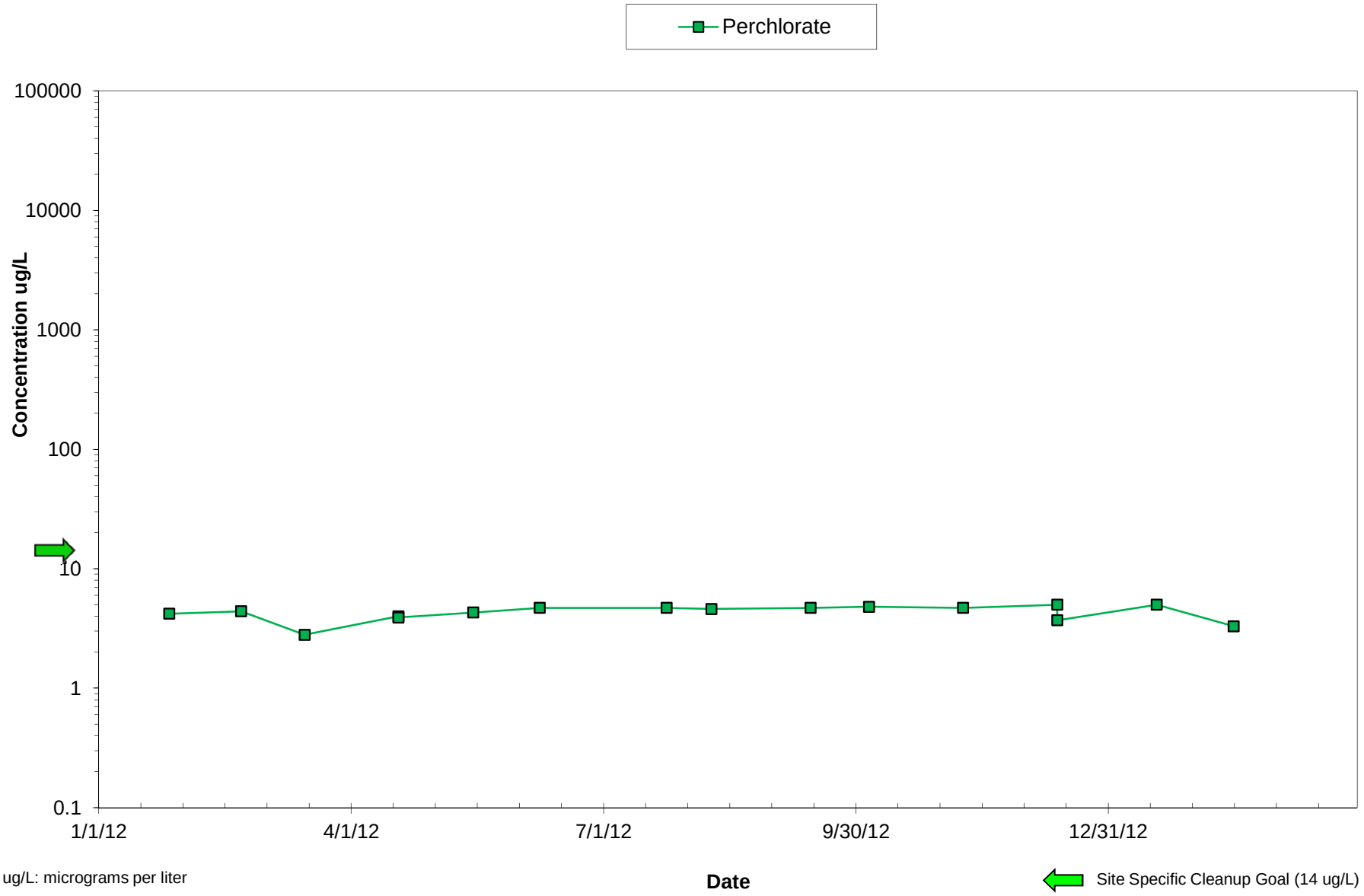
EPA MW-1C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

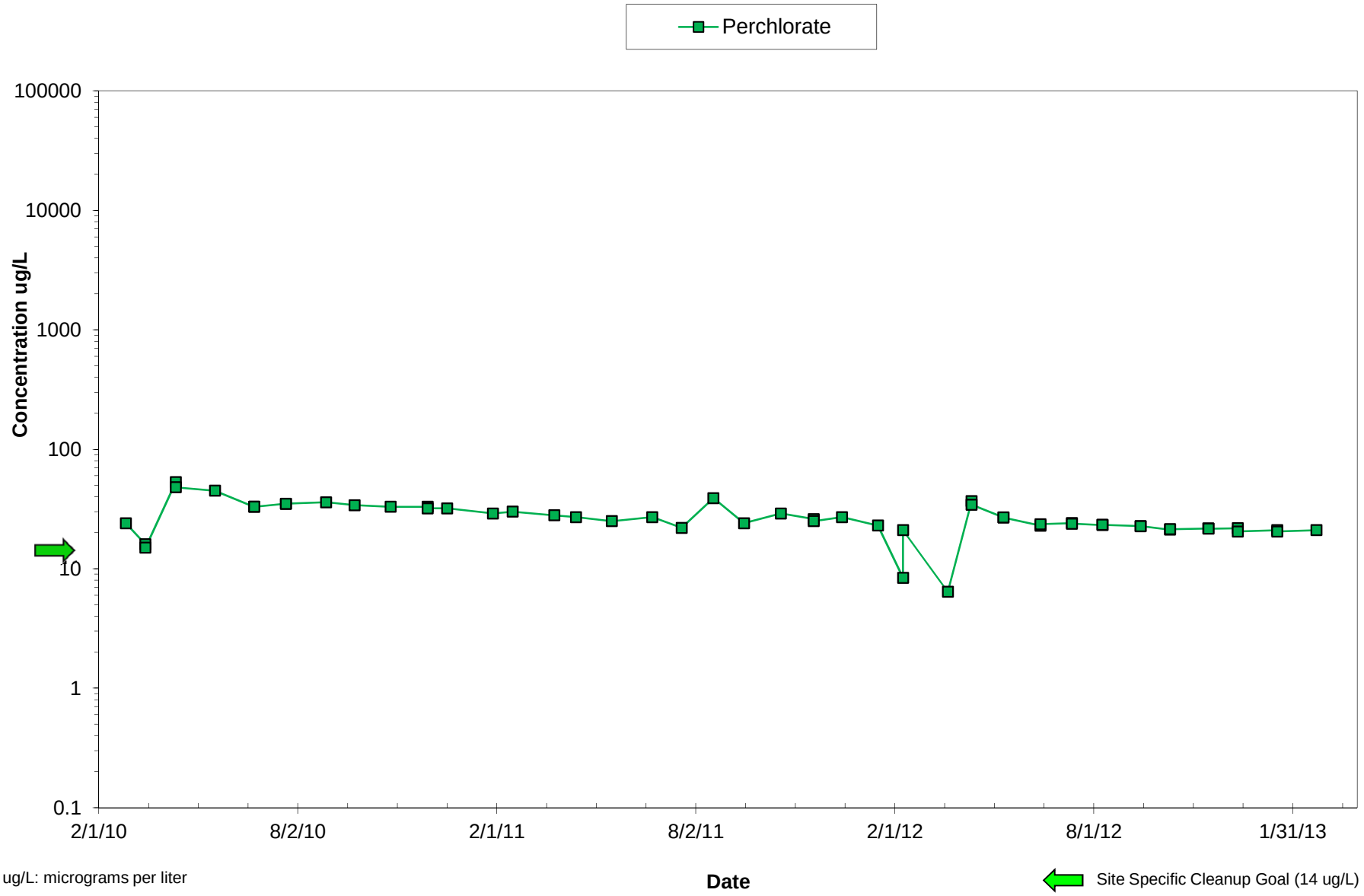
EPA MW-2C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

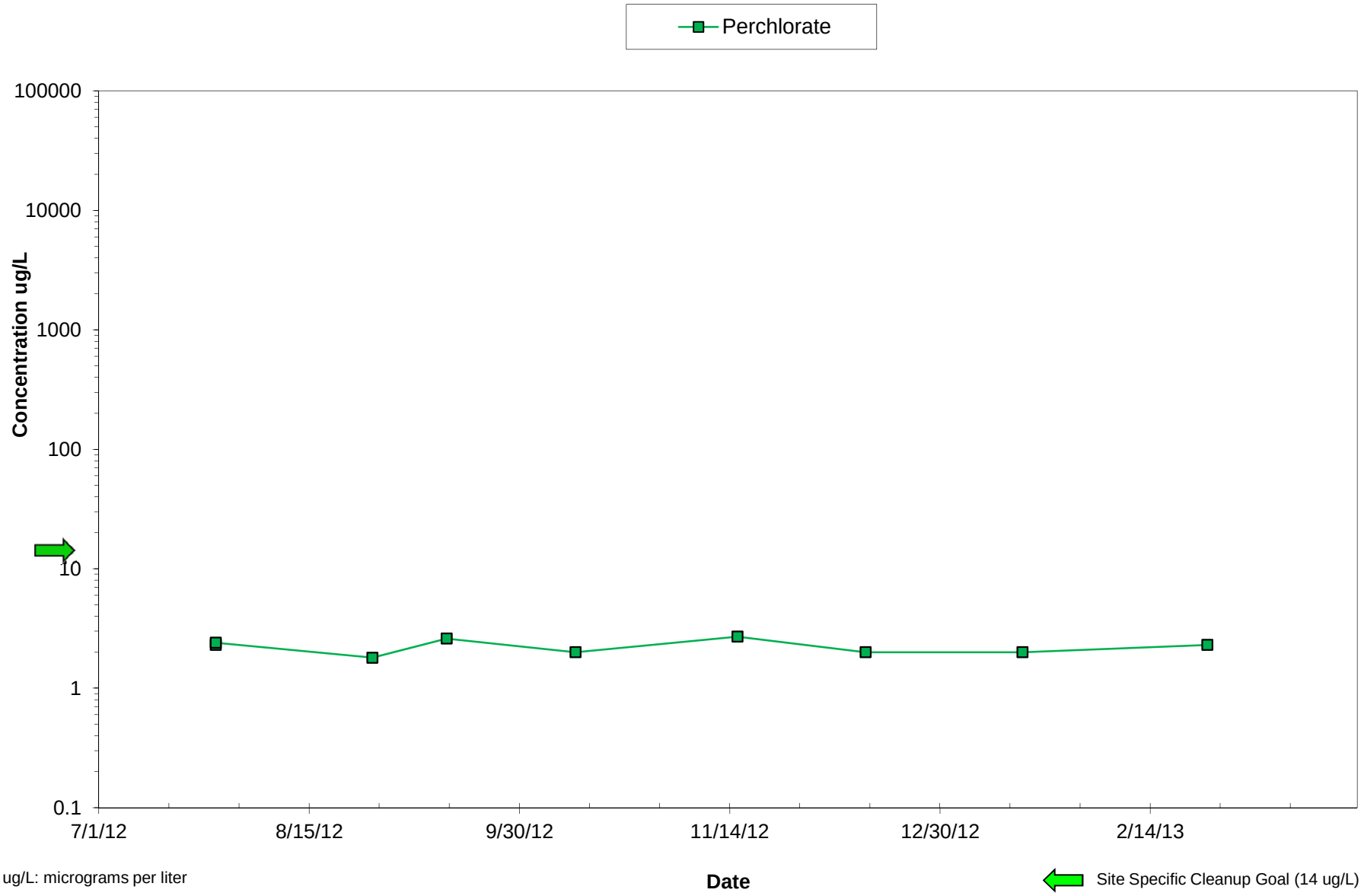
EPA MW-3C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

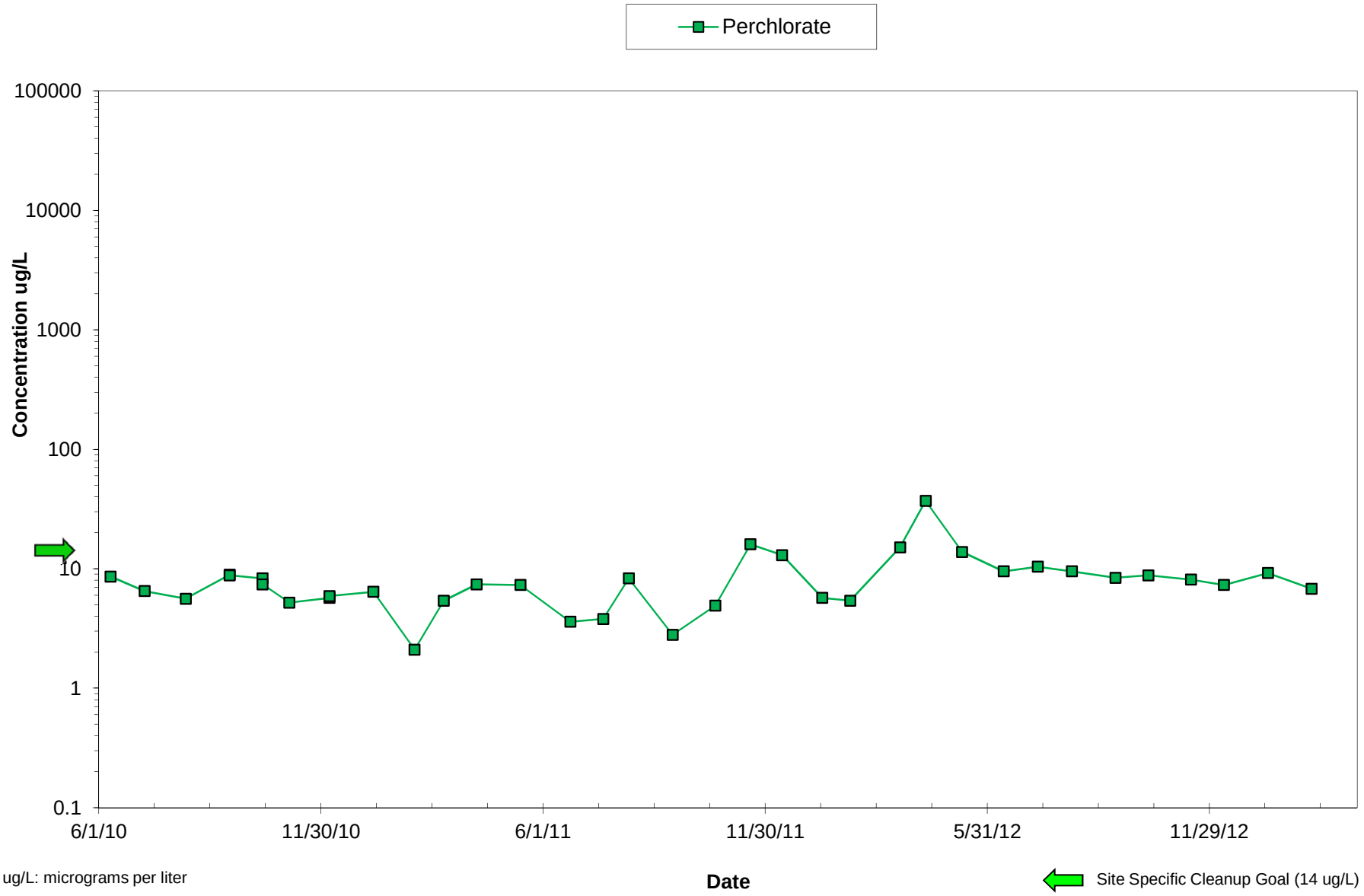
EPA MW-4C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

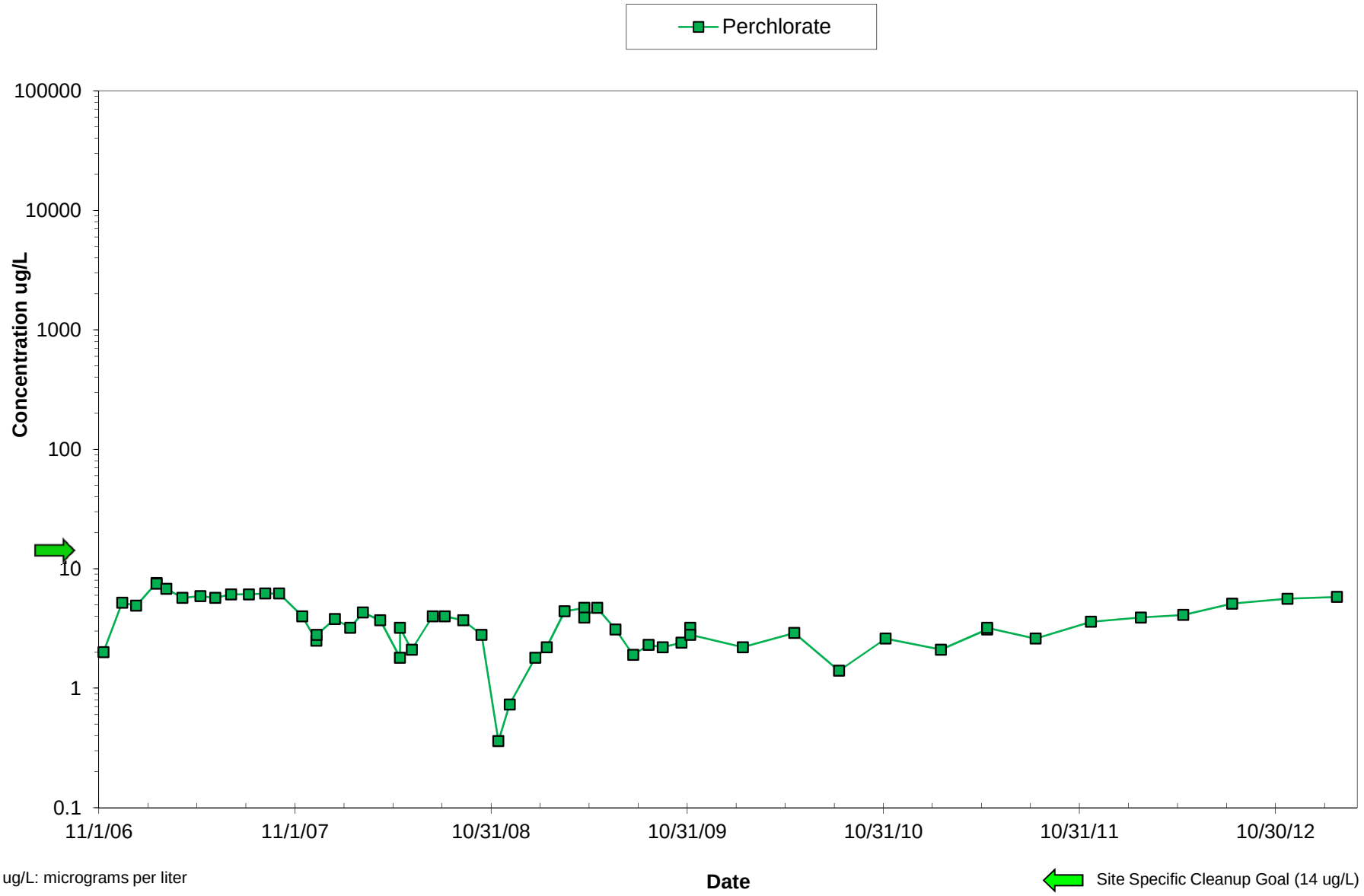
EPA MW-5C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

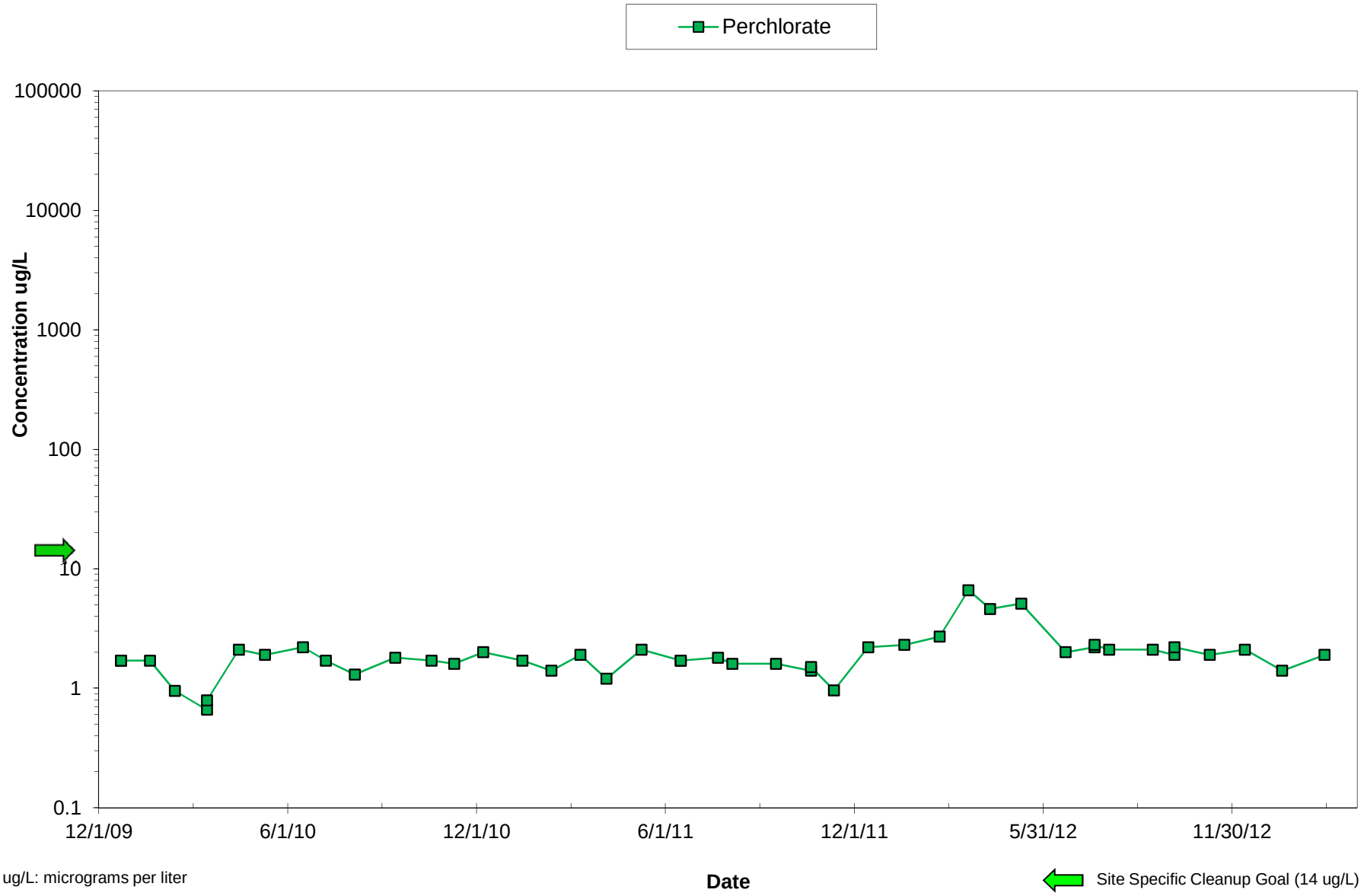
EPA MW-6C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

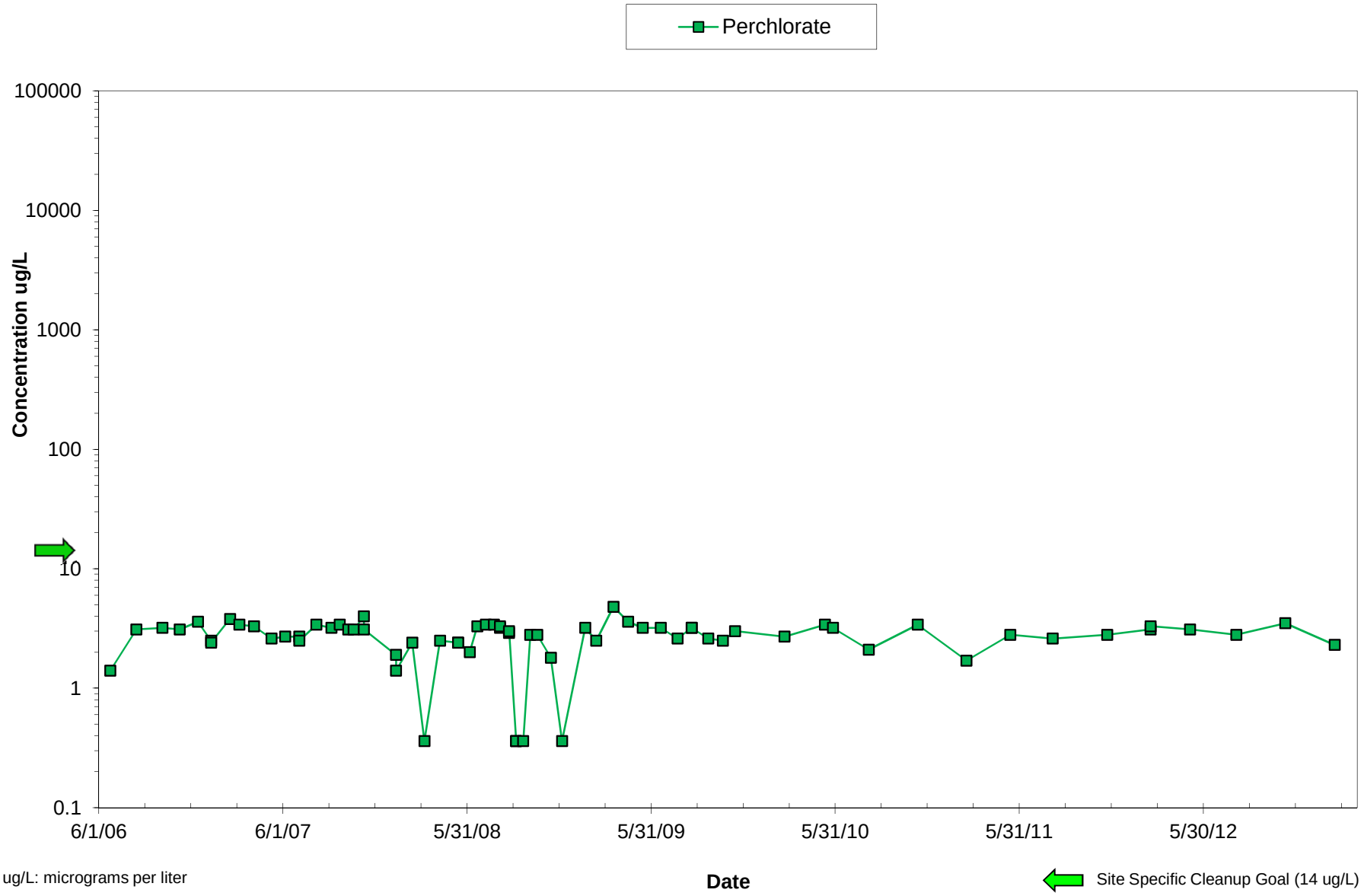
EPA MW-8C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

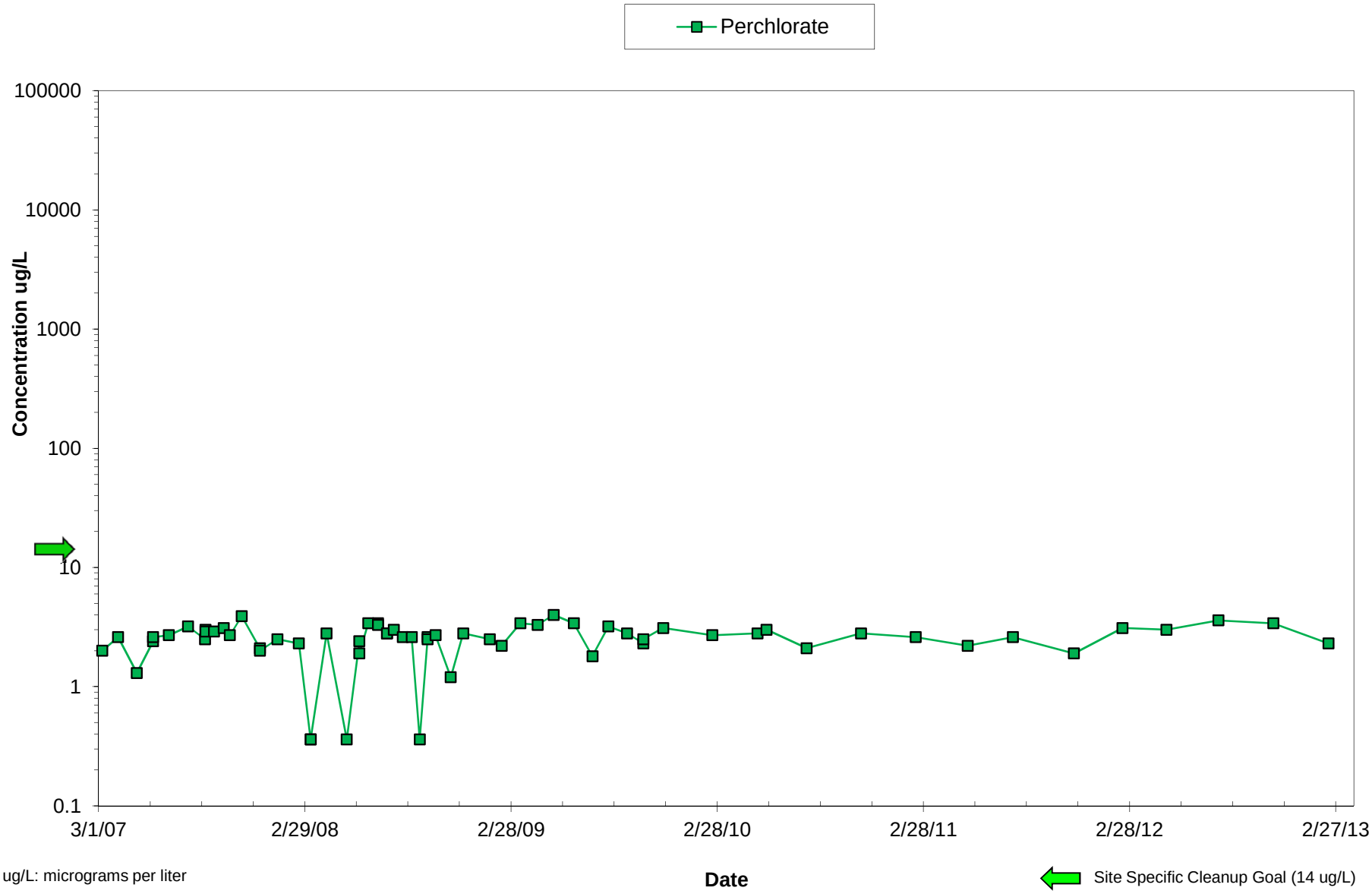
EPA MW-9C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

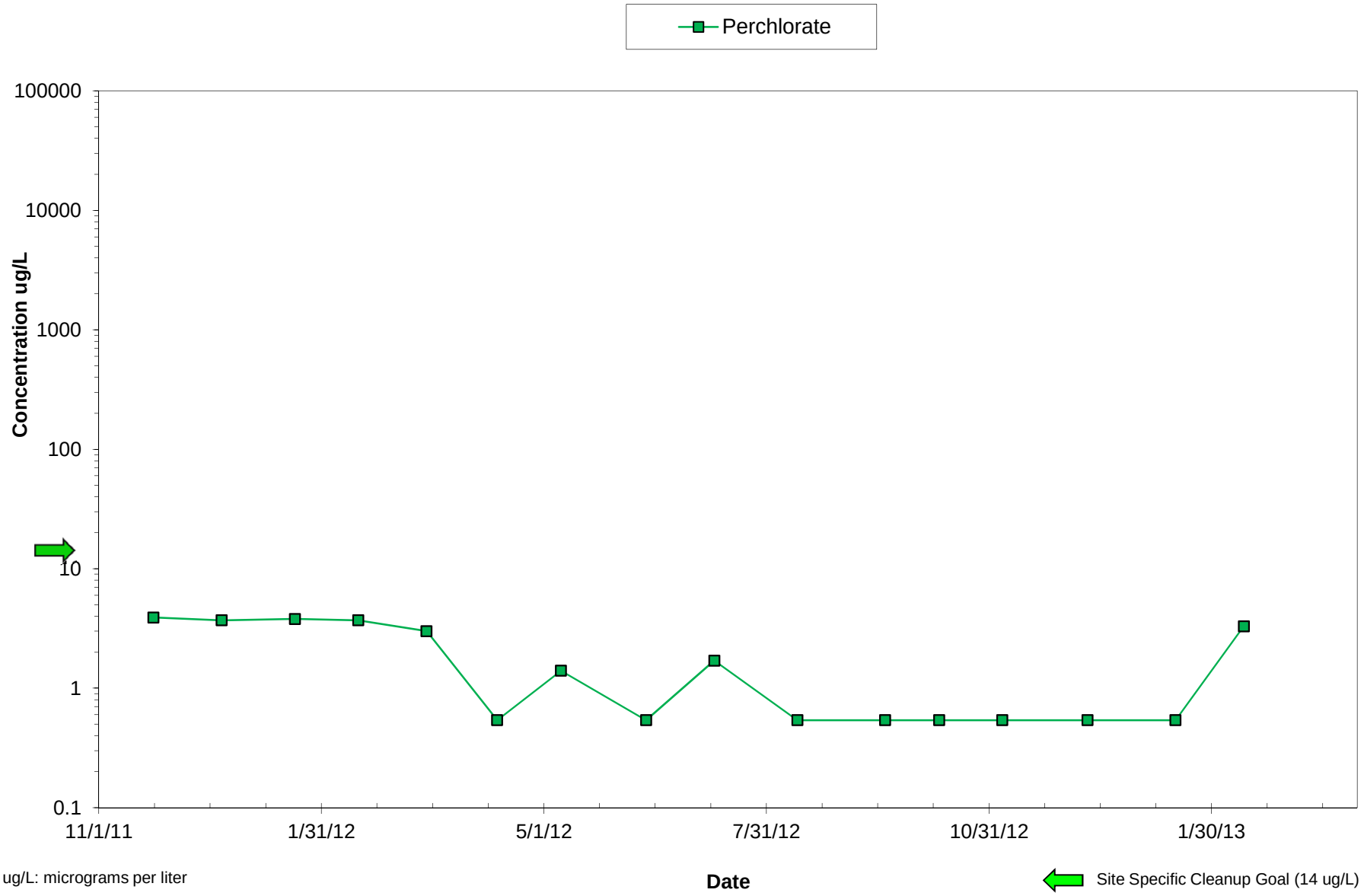
EPA MW-10C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

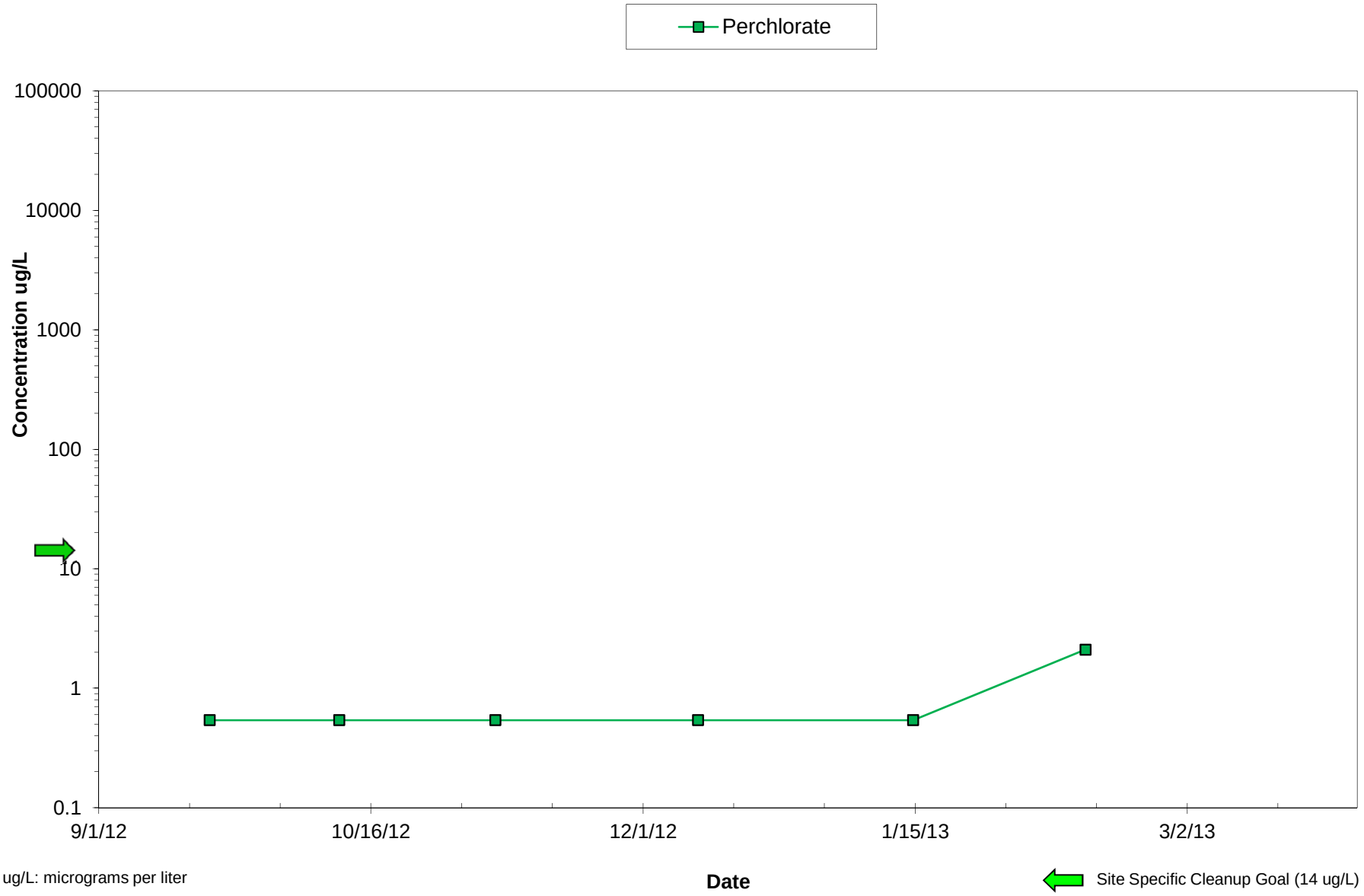
EPA MW-12C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

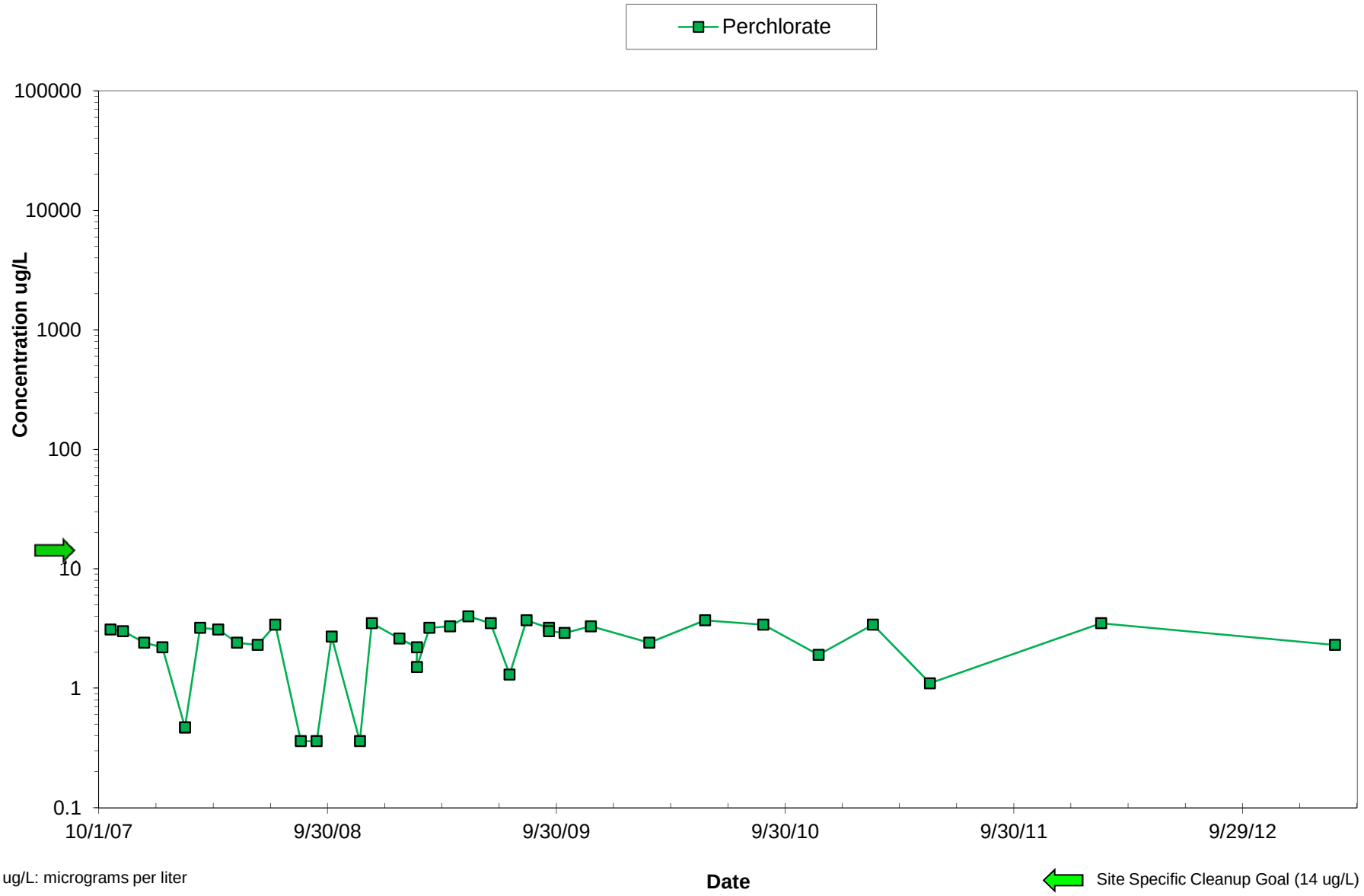
EPA MW-13C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

EPA MW-14C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

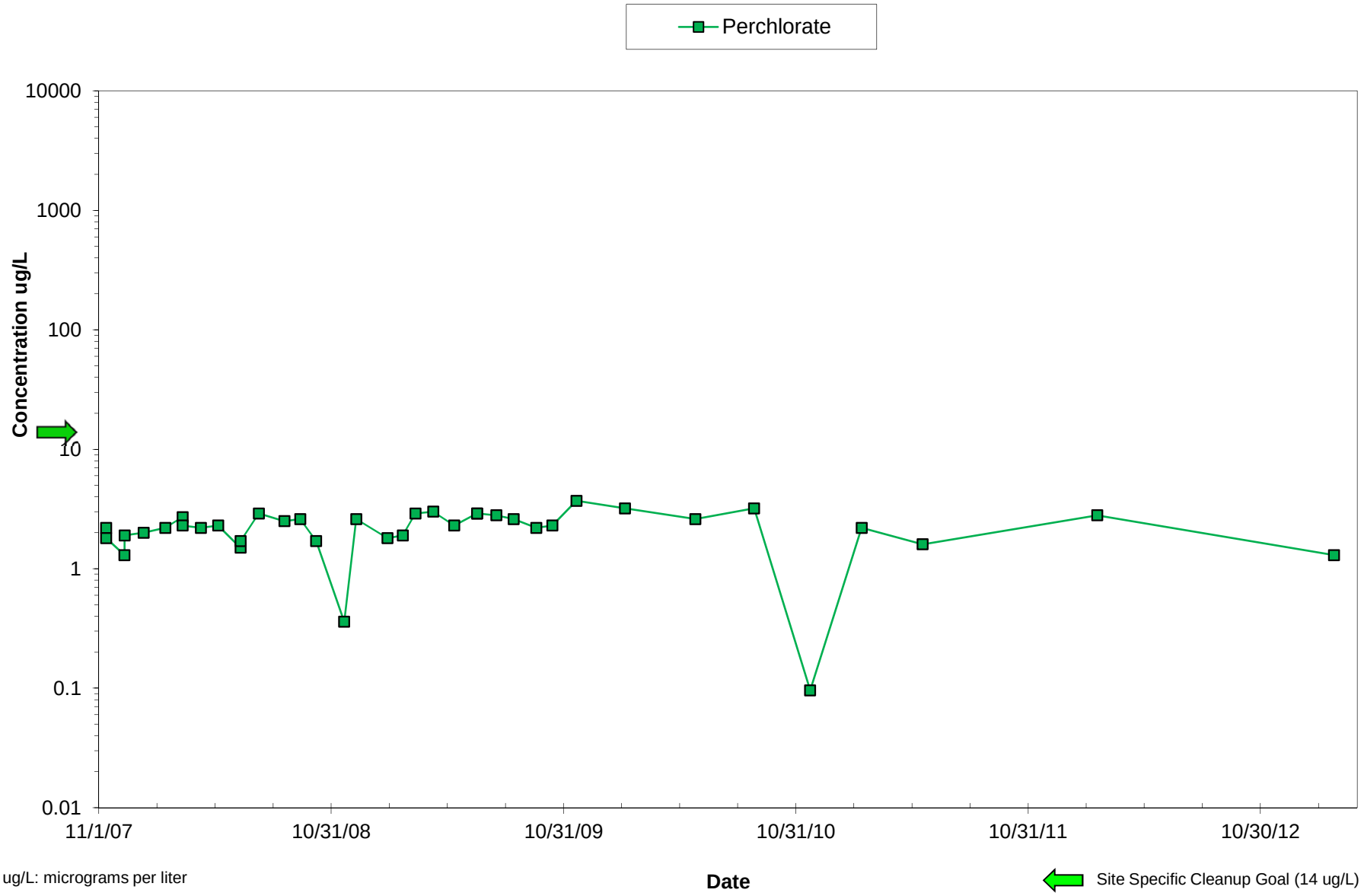
MATRIXNEWORLD
Enabling Progress

EPA MW-15C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona

ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

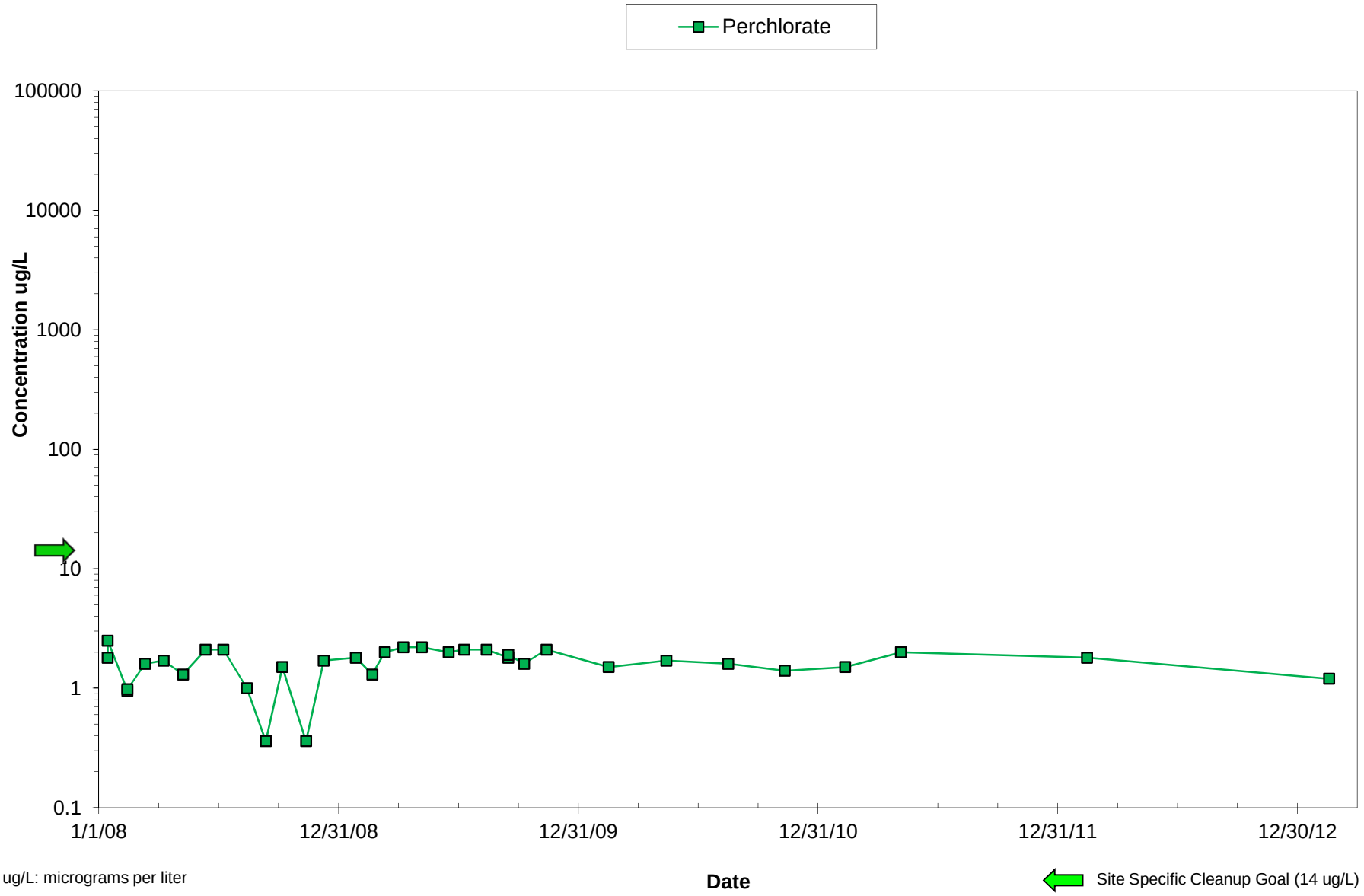
EPA MW-16C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

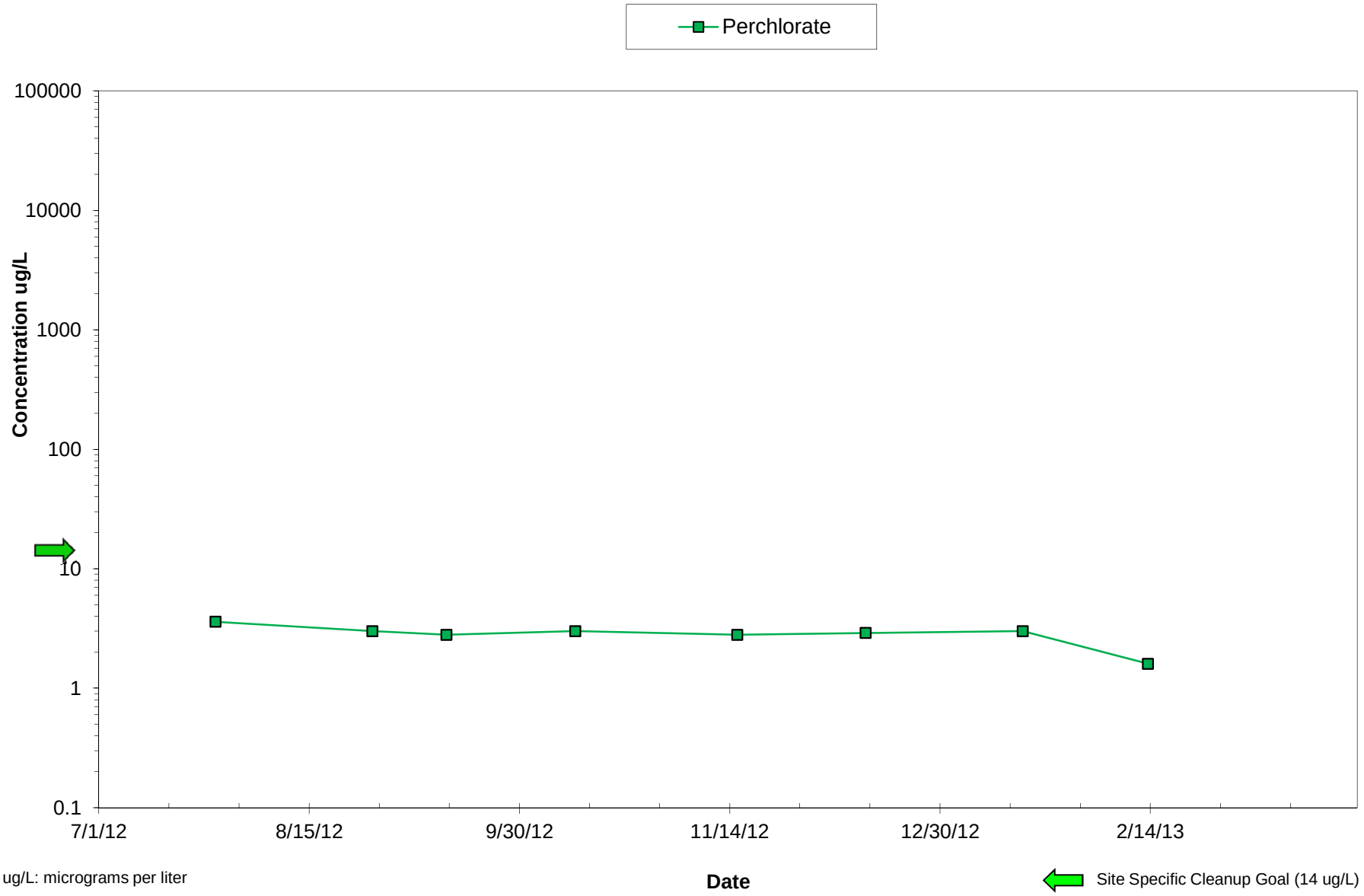
EPA MW-17C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

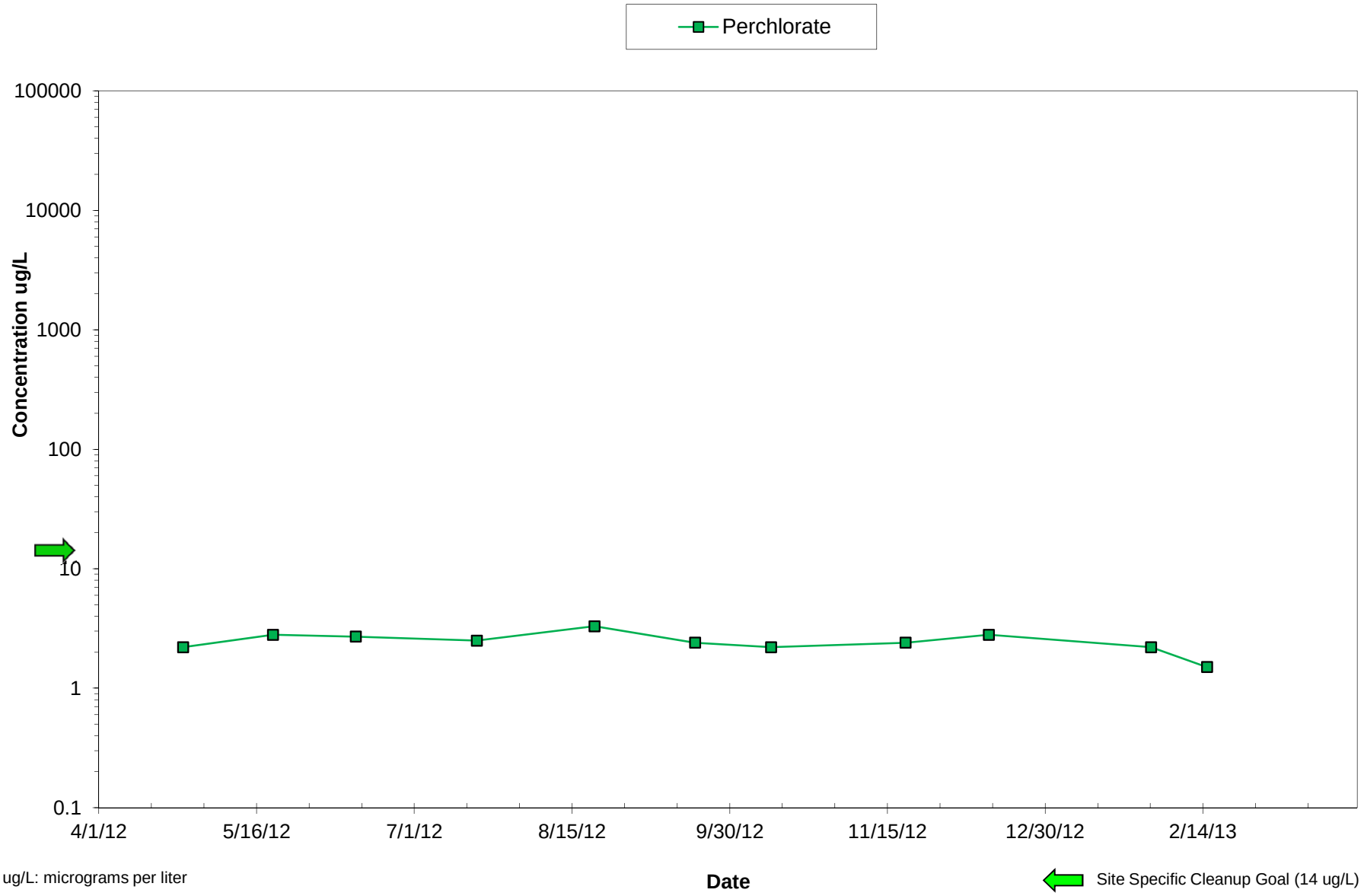
EPA MW-19C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

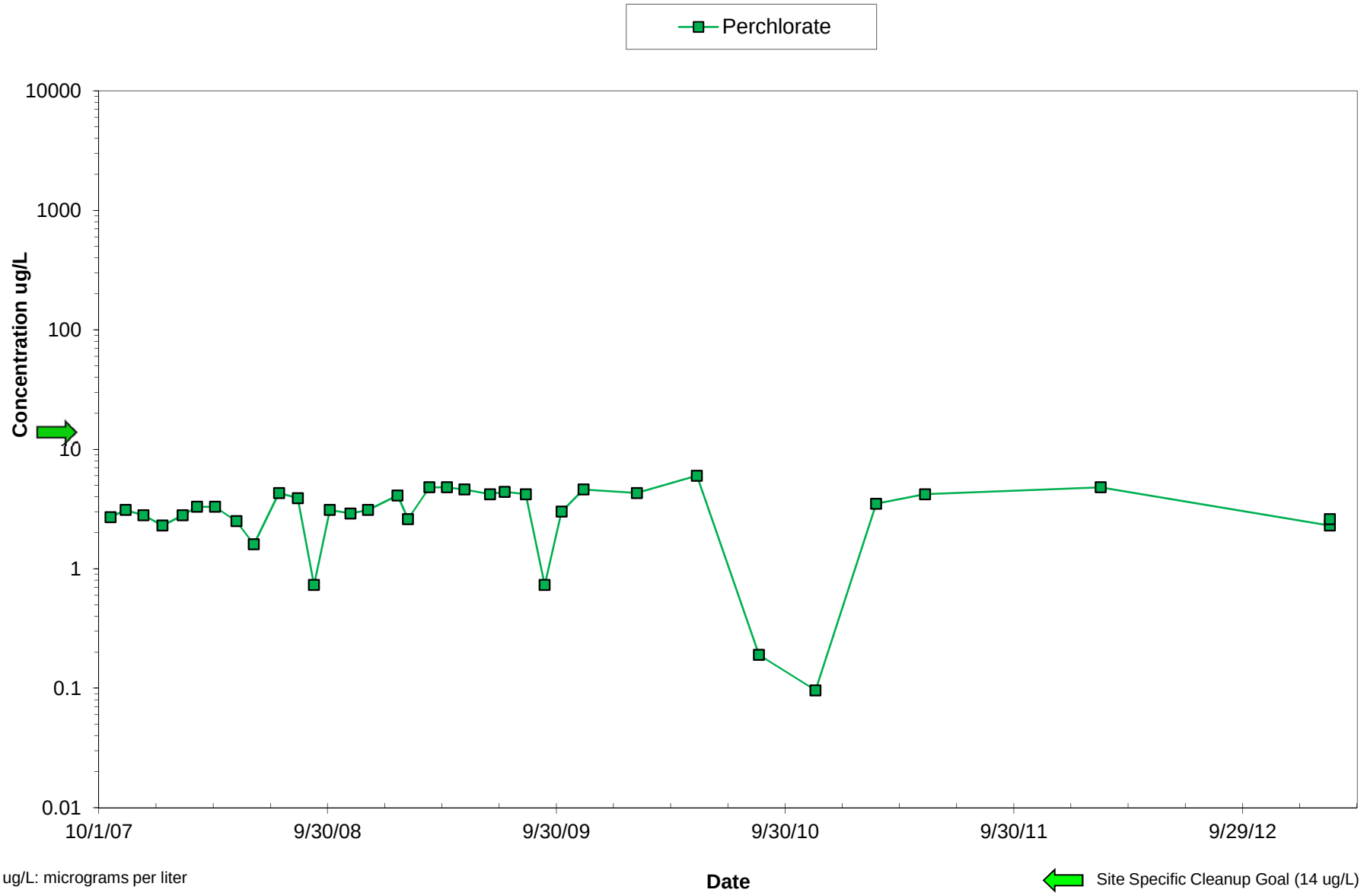
EPA MW-22C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

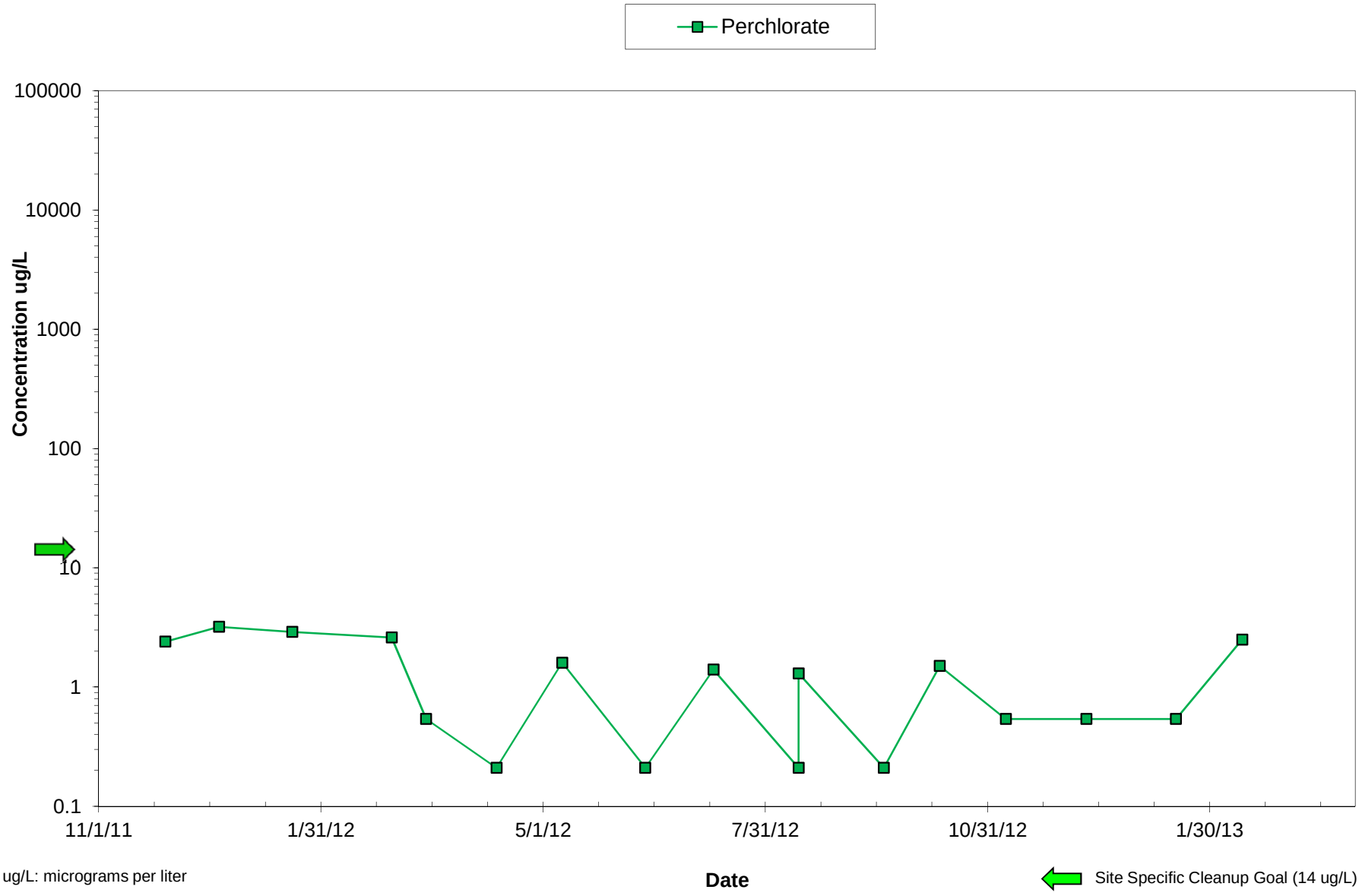
EPA MW-24C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

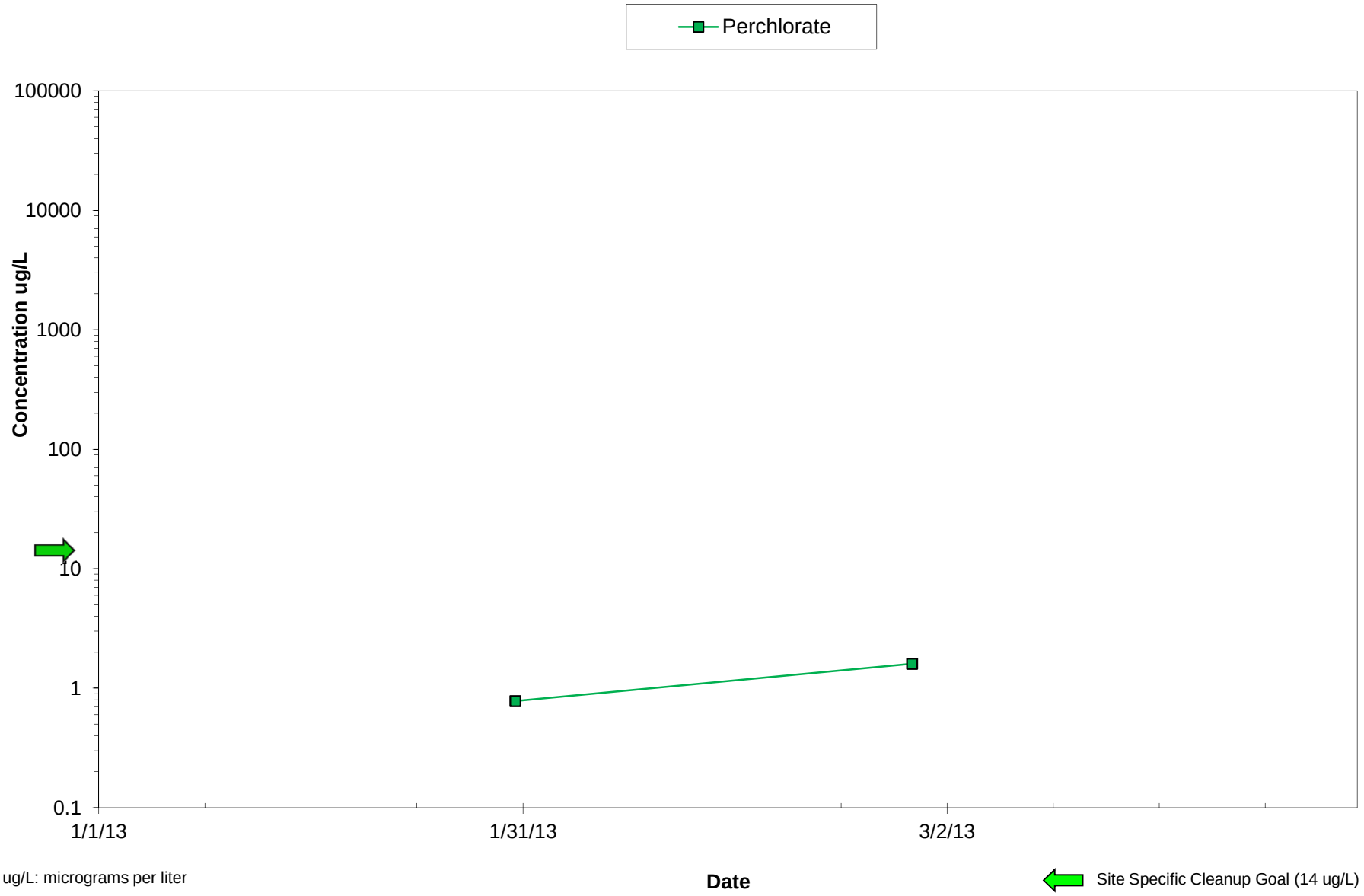
EPA MW-26C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

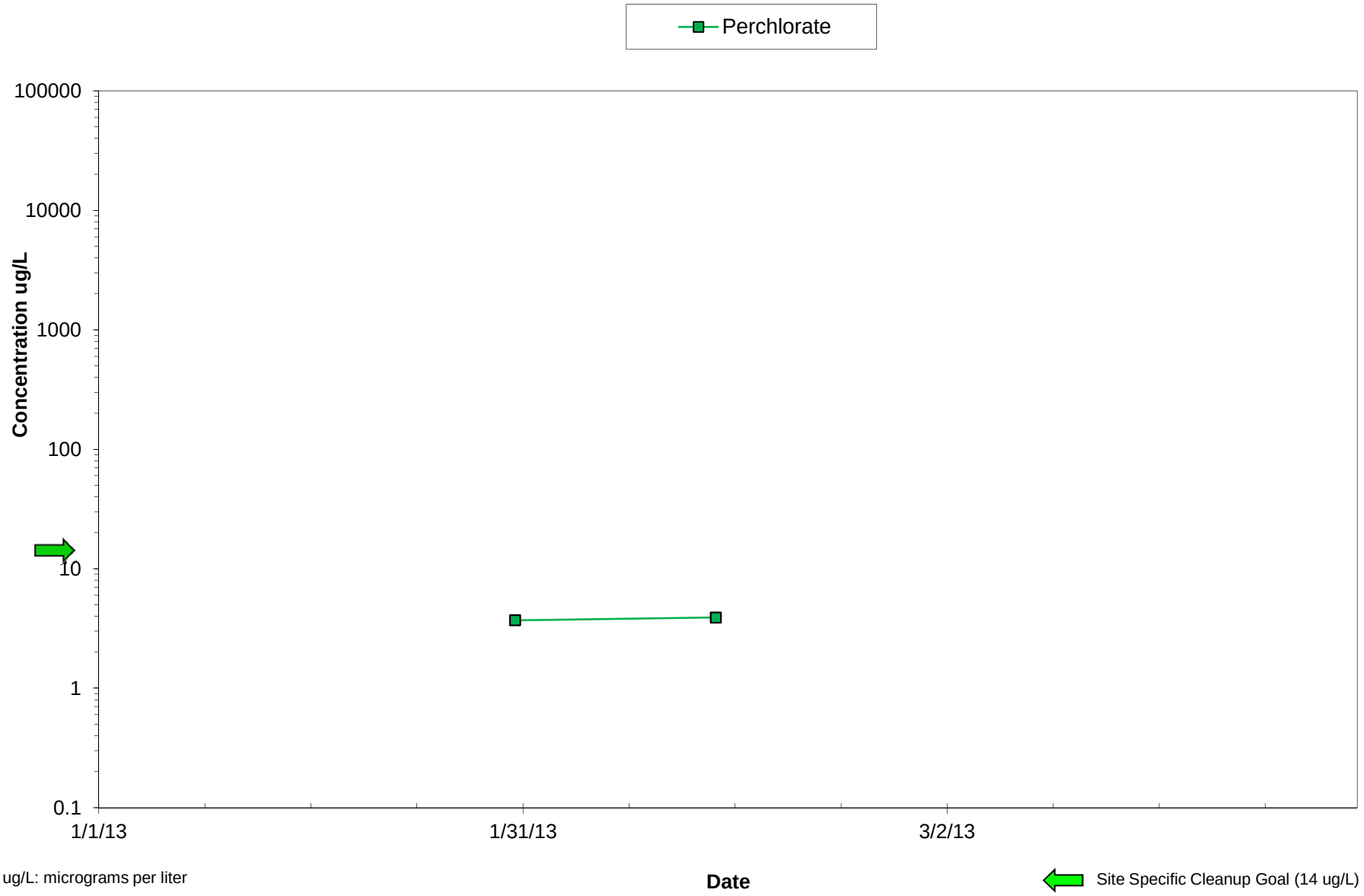
EPA MW-27C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

EPA MW-28C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

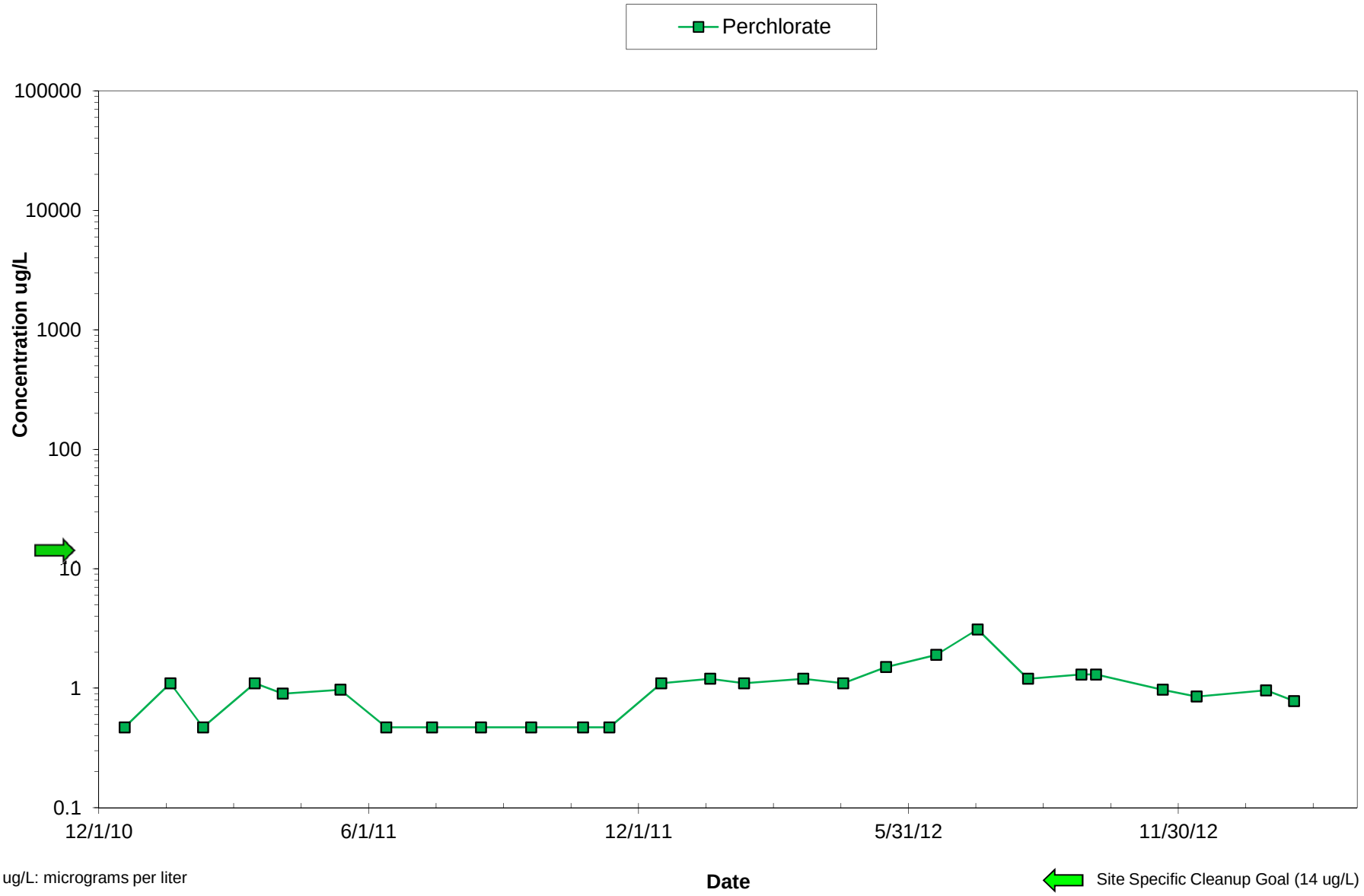
MATRIXNEWORLD
Enabling Progress

EPA MW-39C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona

ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

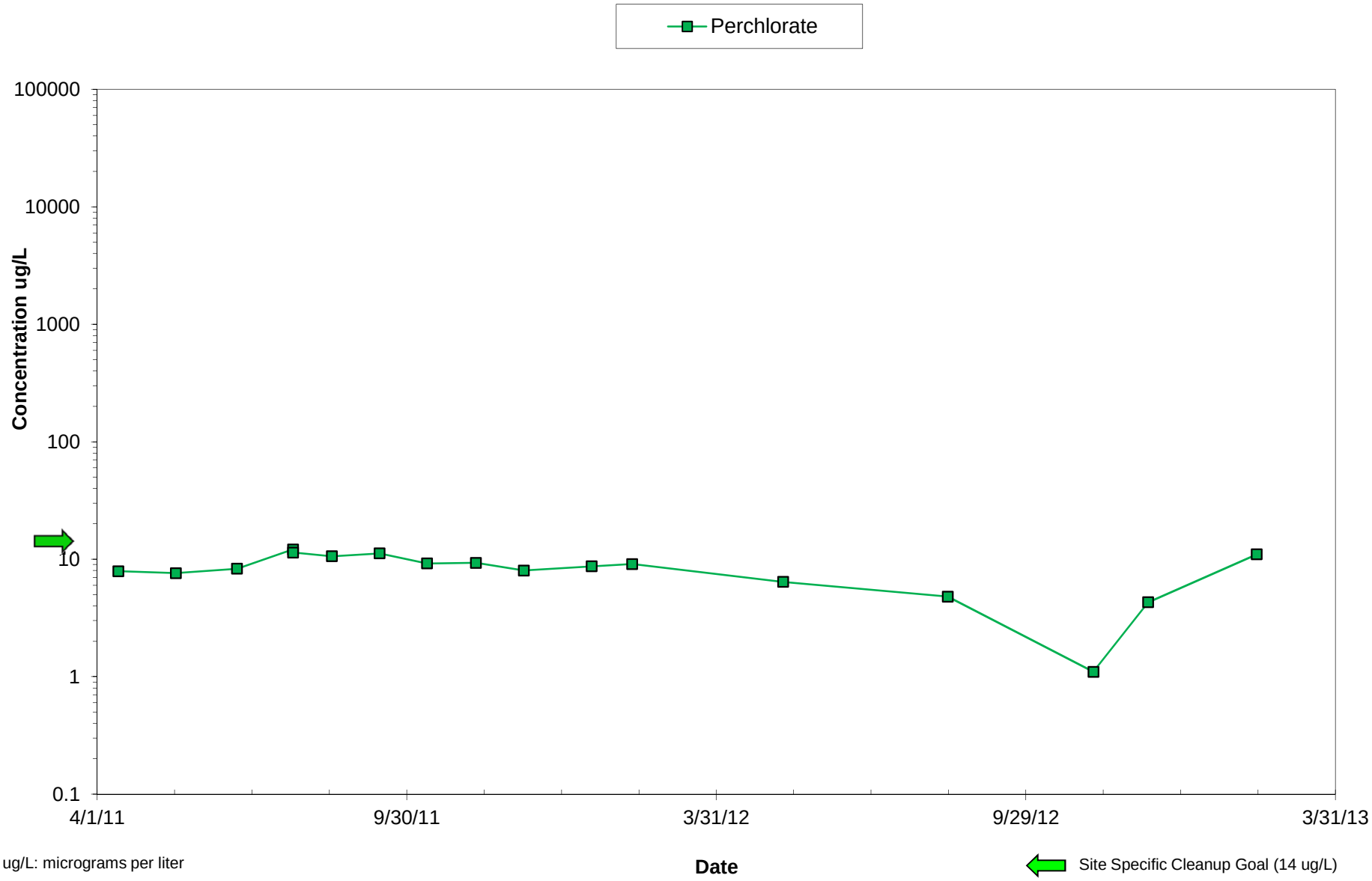
EPA MW-40C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

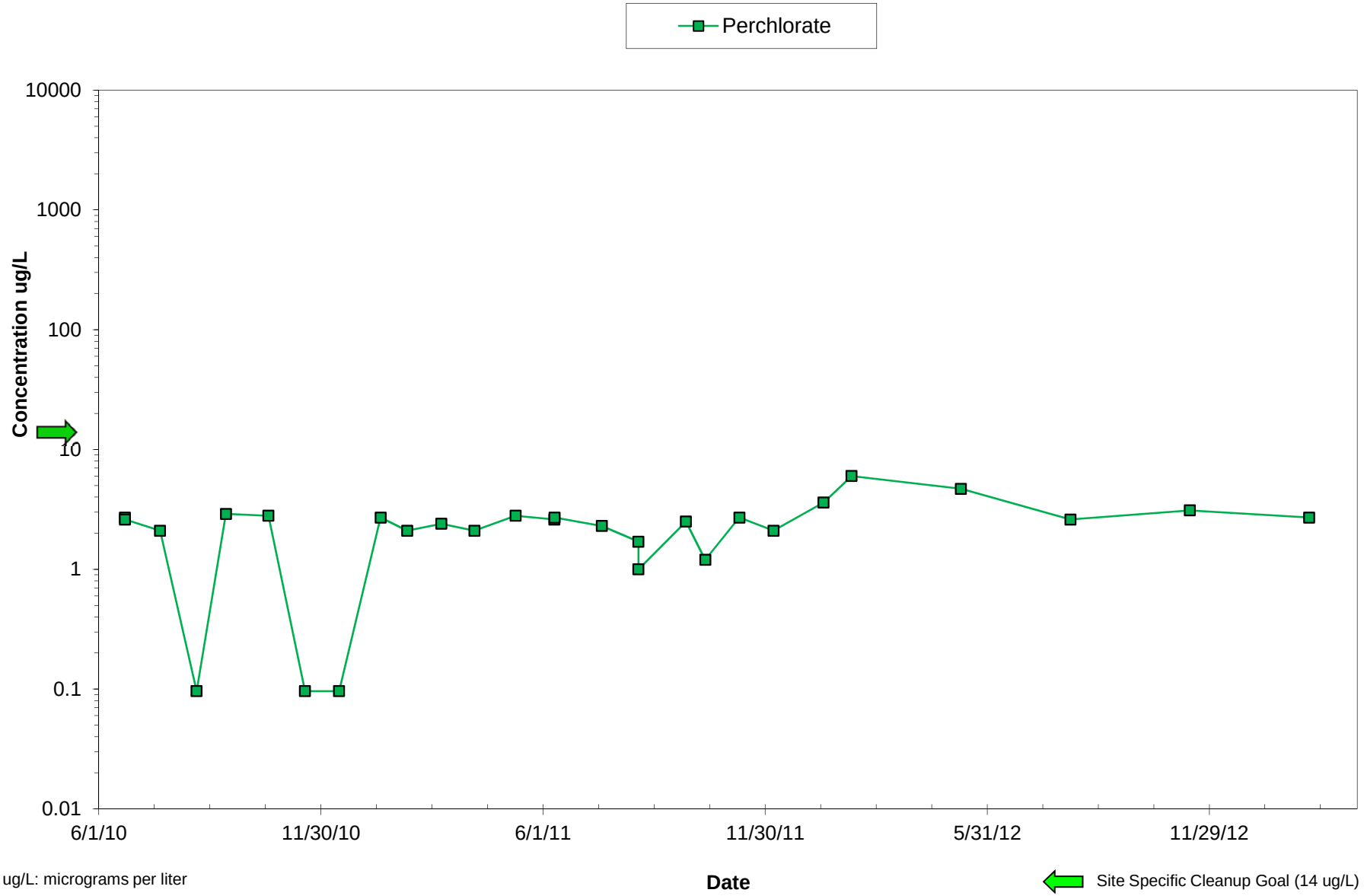
EPA MW-47C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

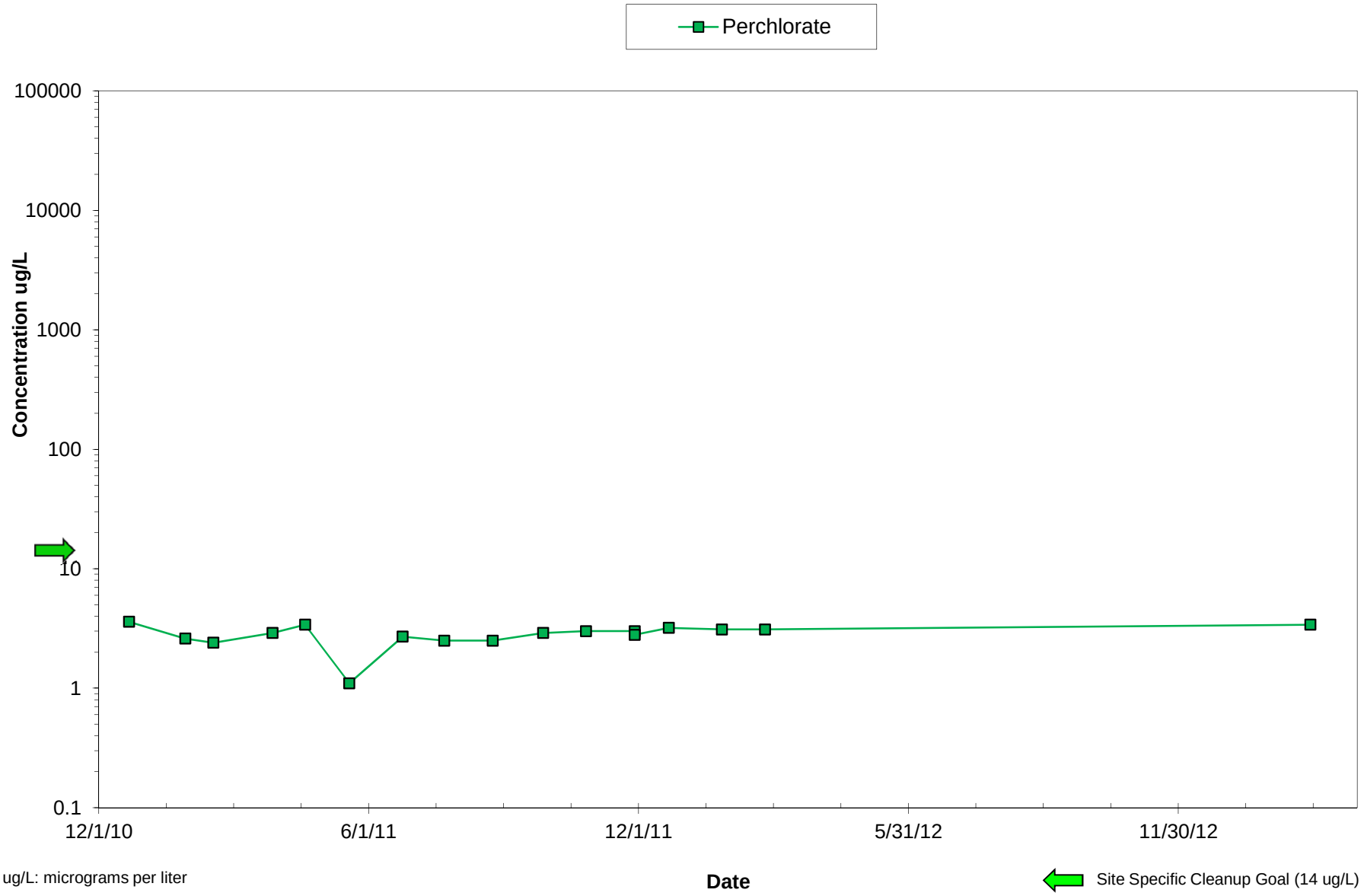
EPA MW-48C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

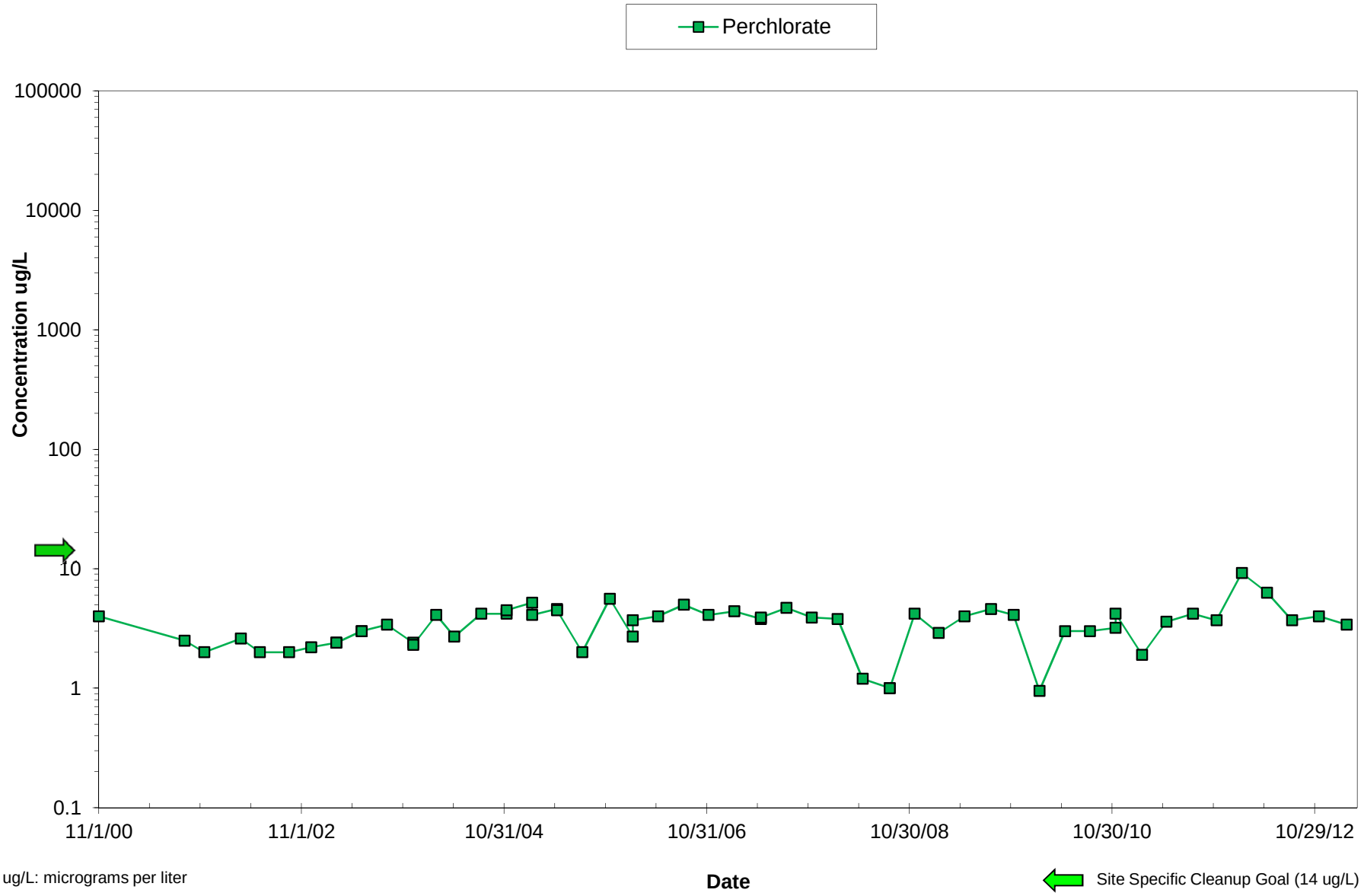
EPA MW-49C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

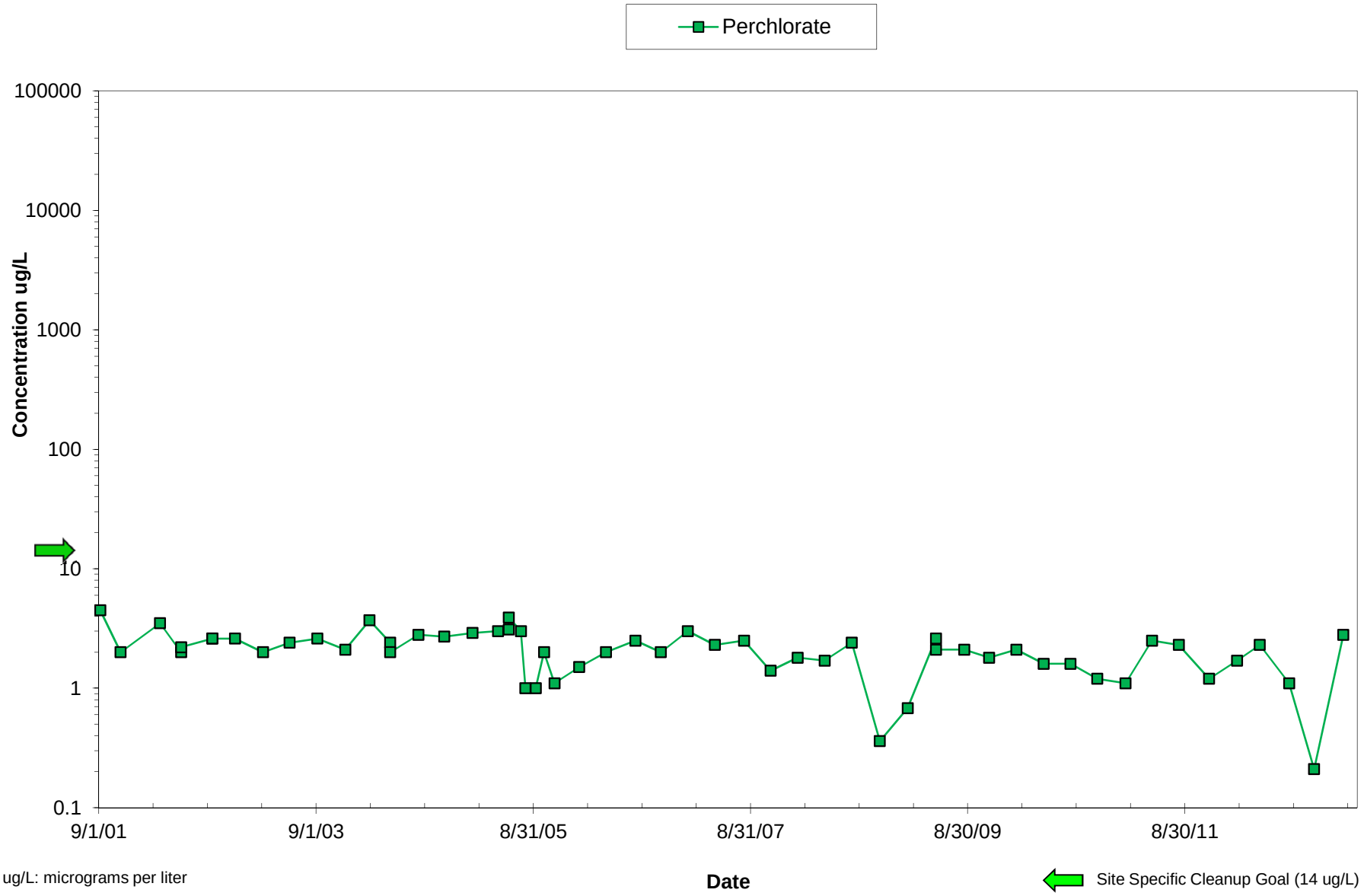
MW-06
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

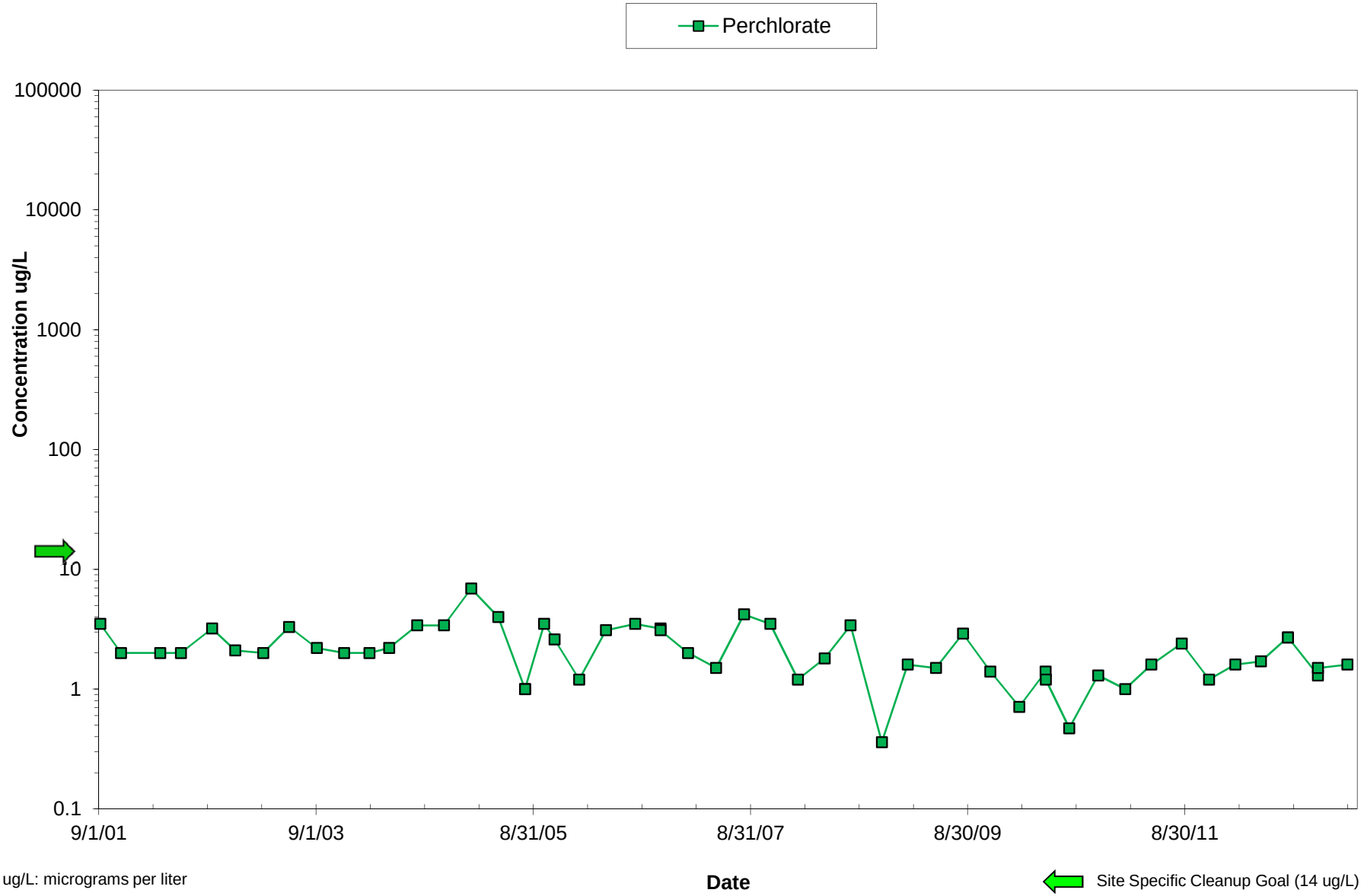
MW-10
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

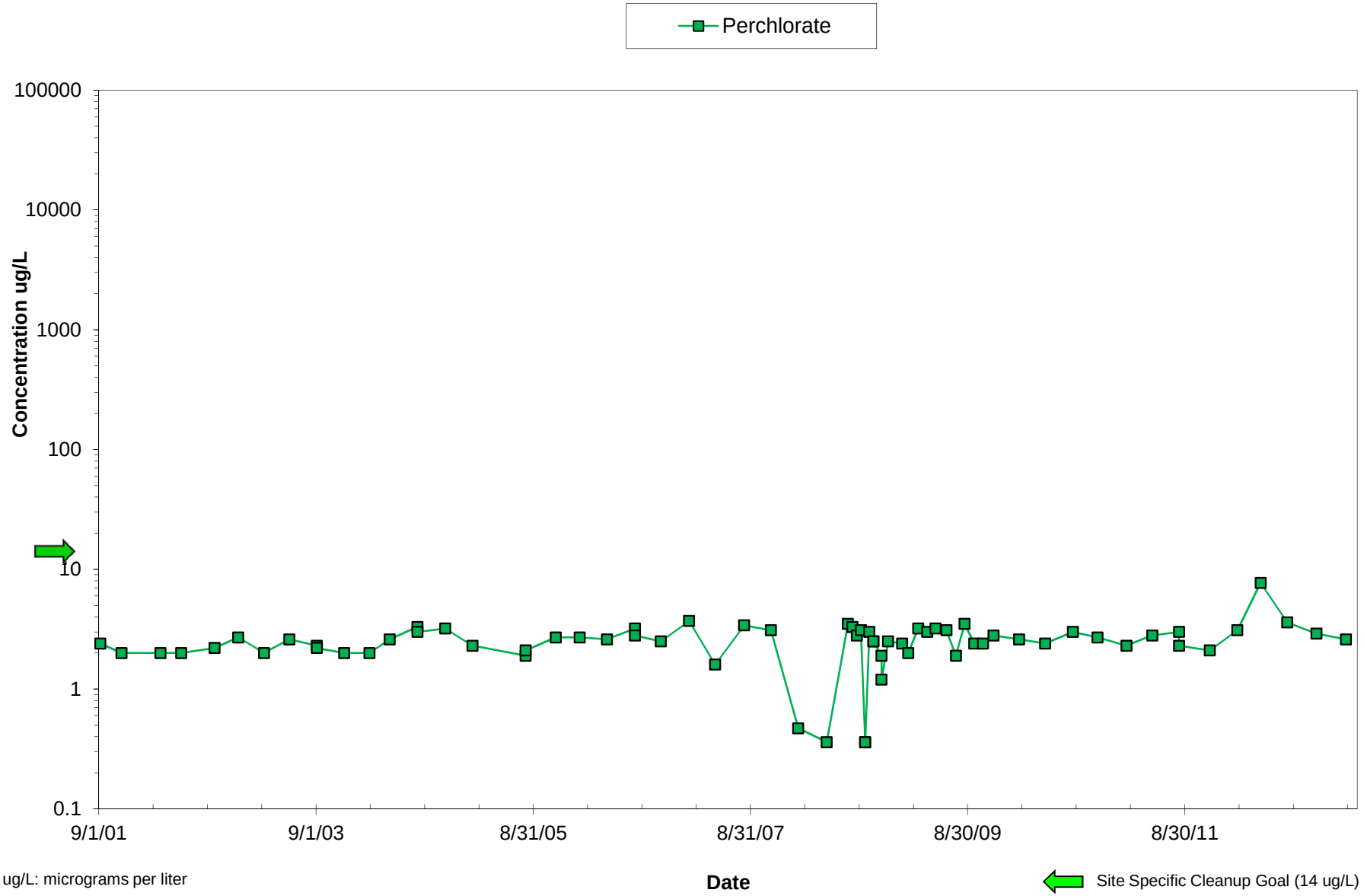
MW-14
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

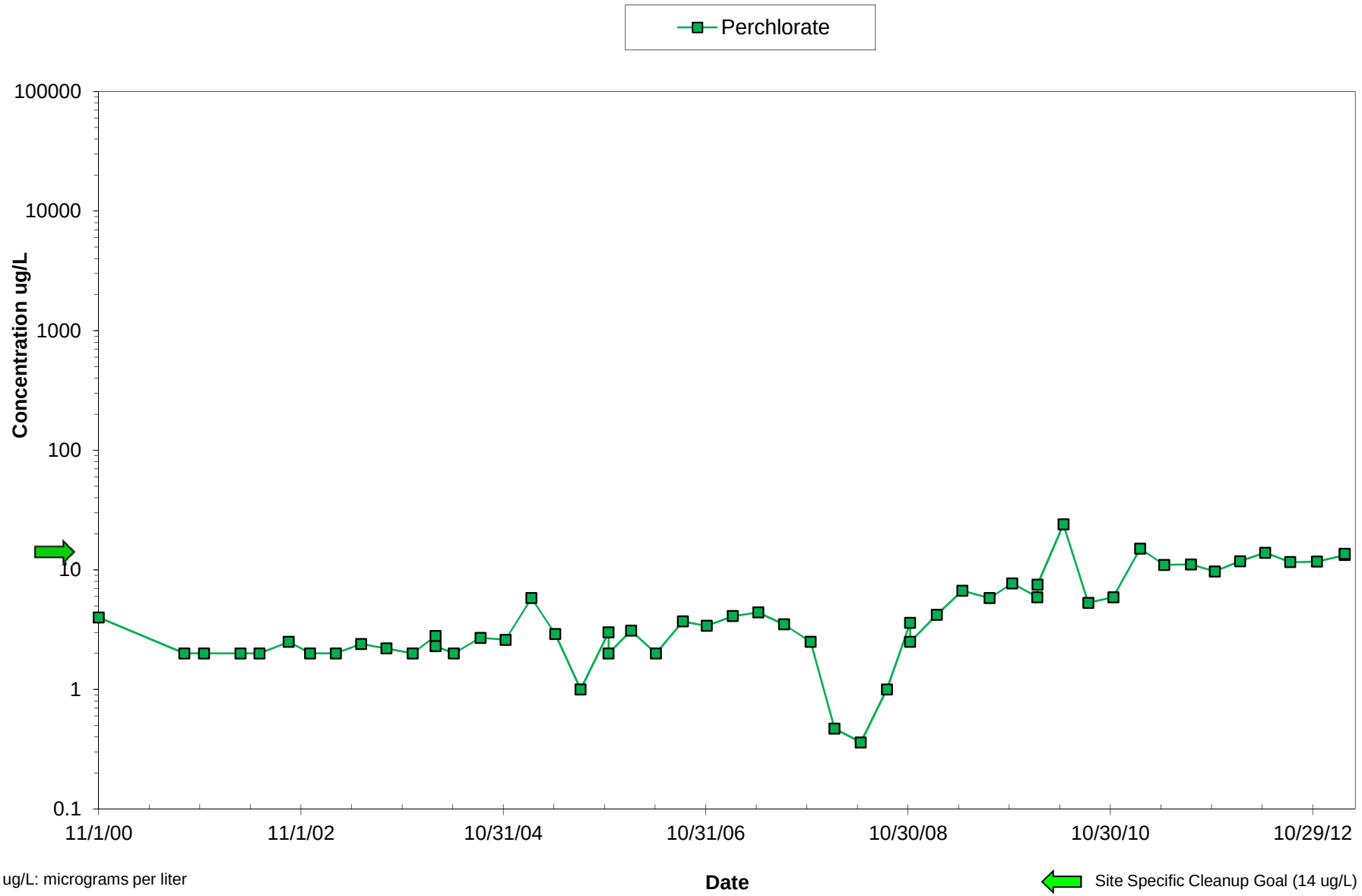
MW-21
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

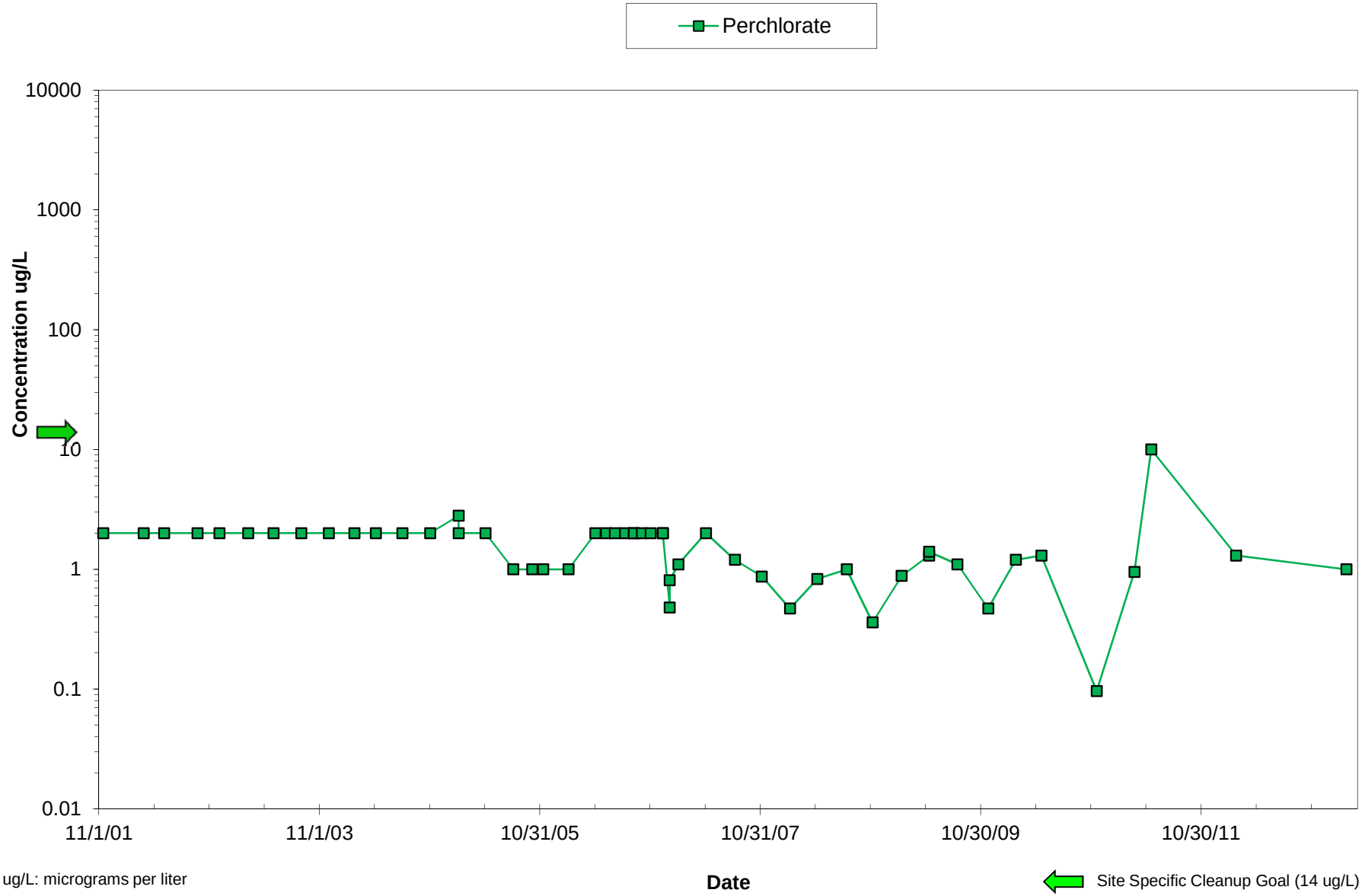
MW-23
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

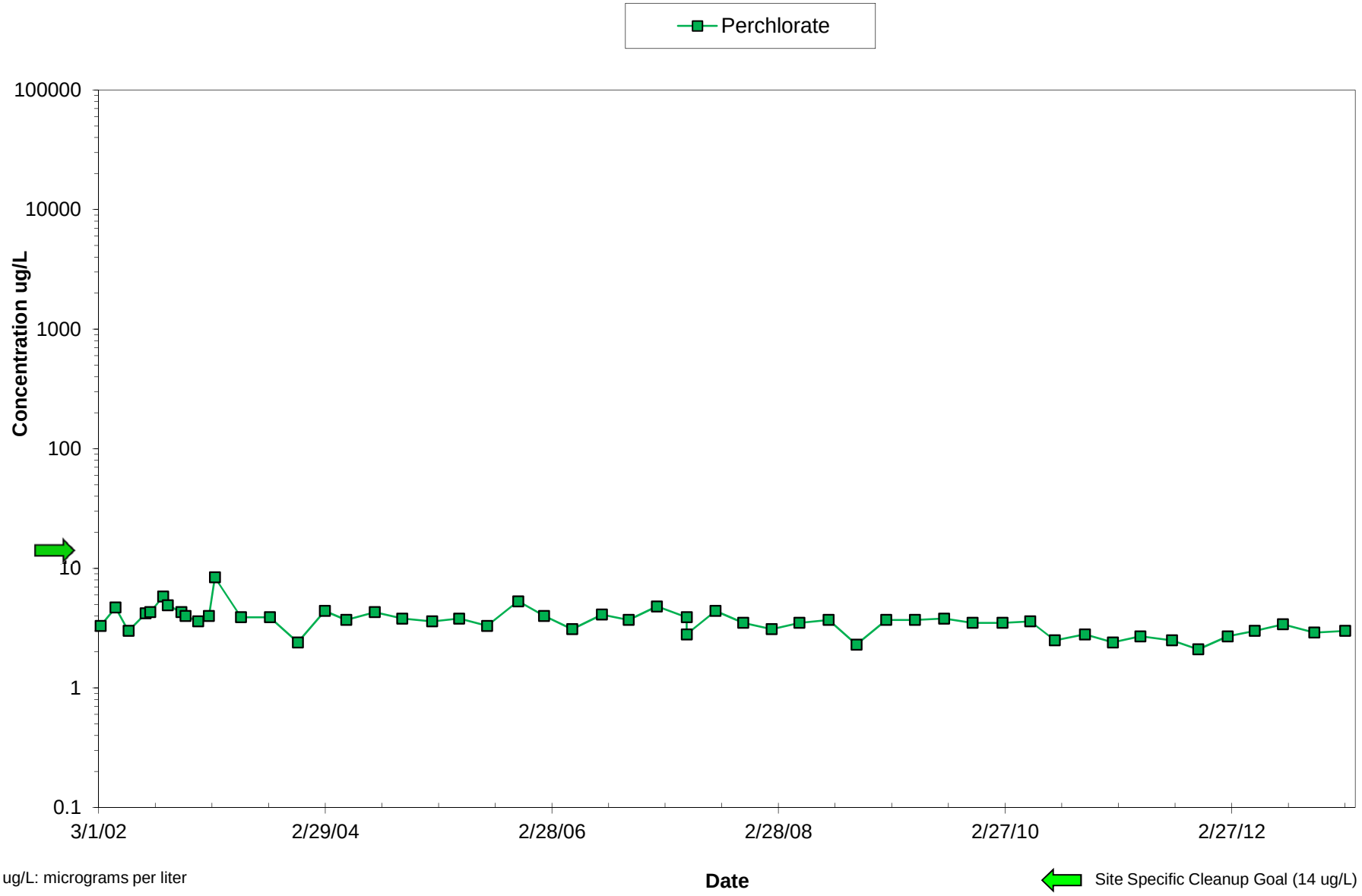
MW-26
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

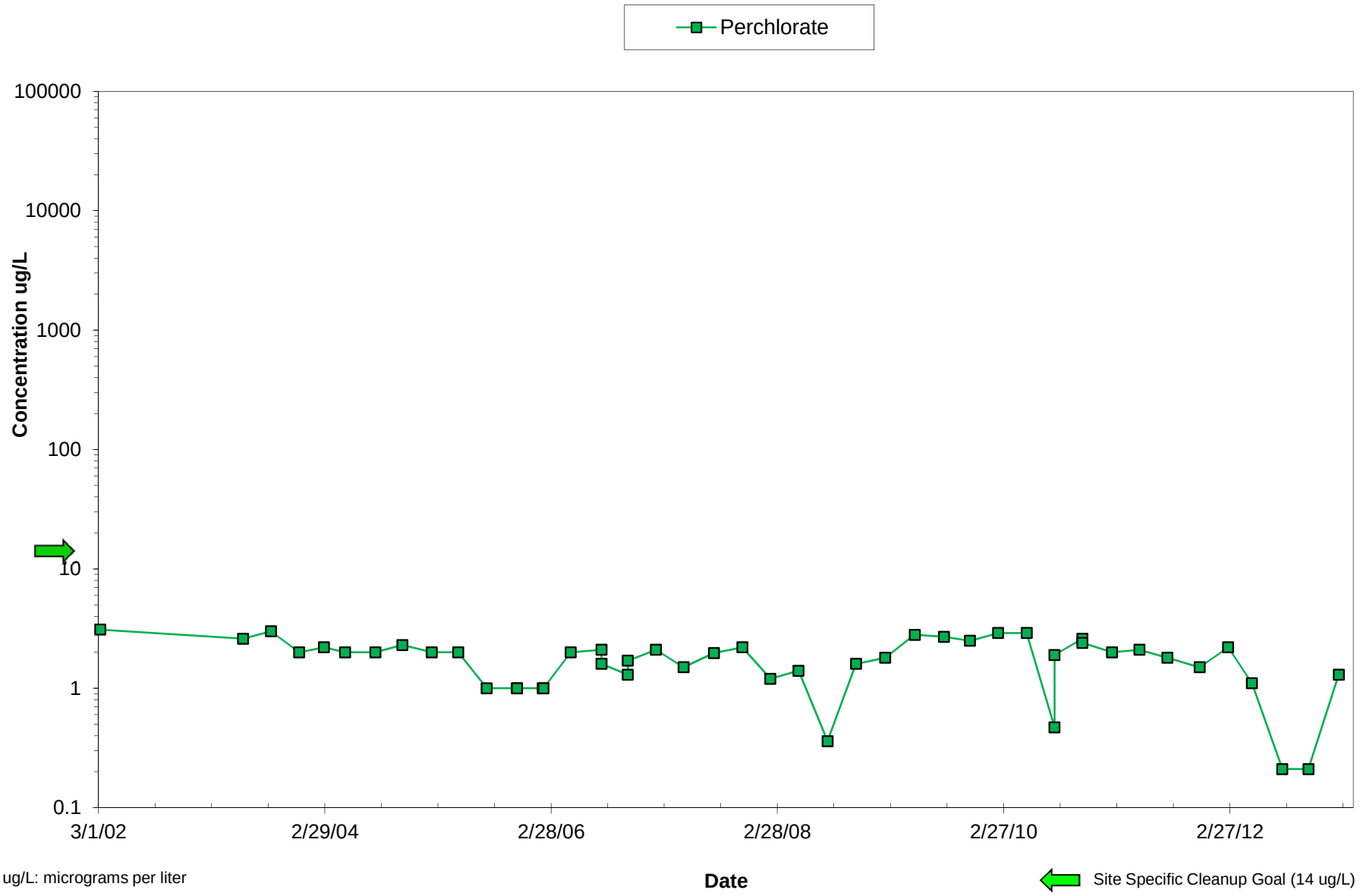
MW-28
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

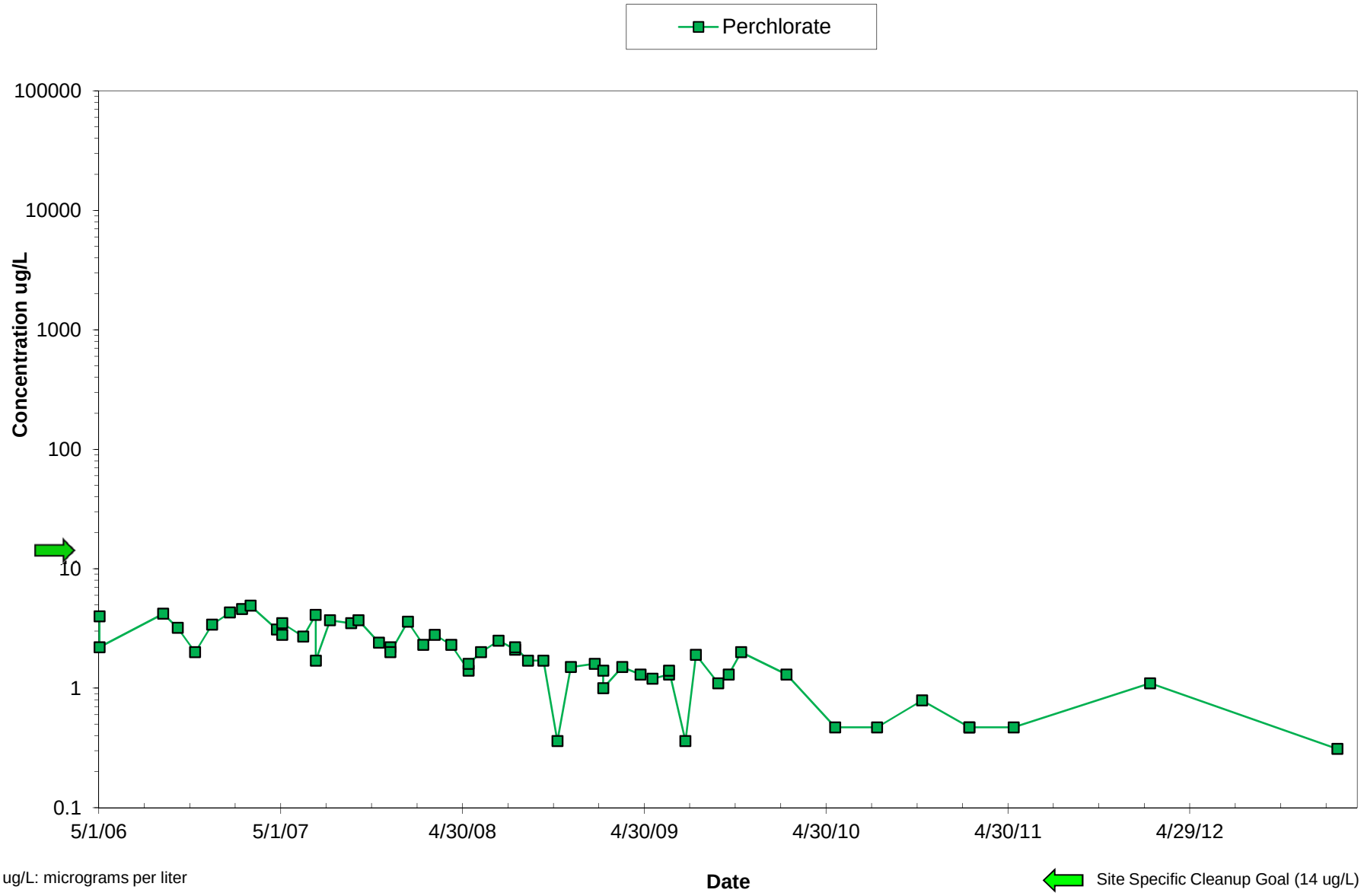
OW-C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

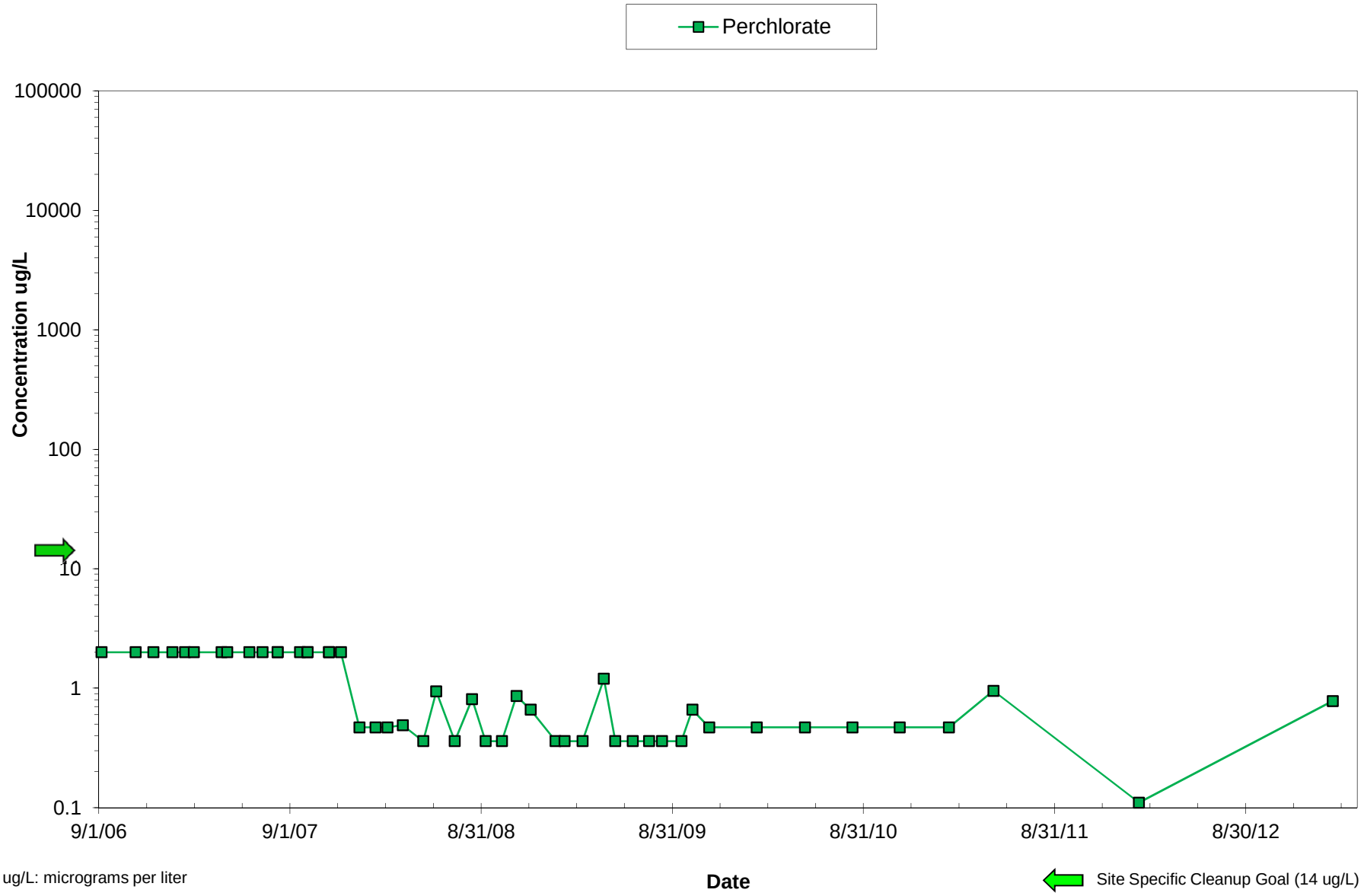
EPA MW-1M
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

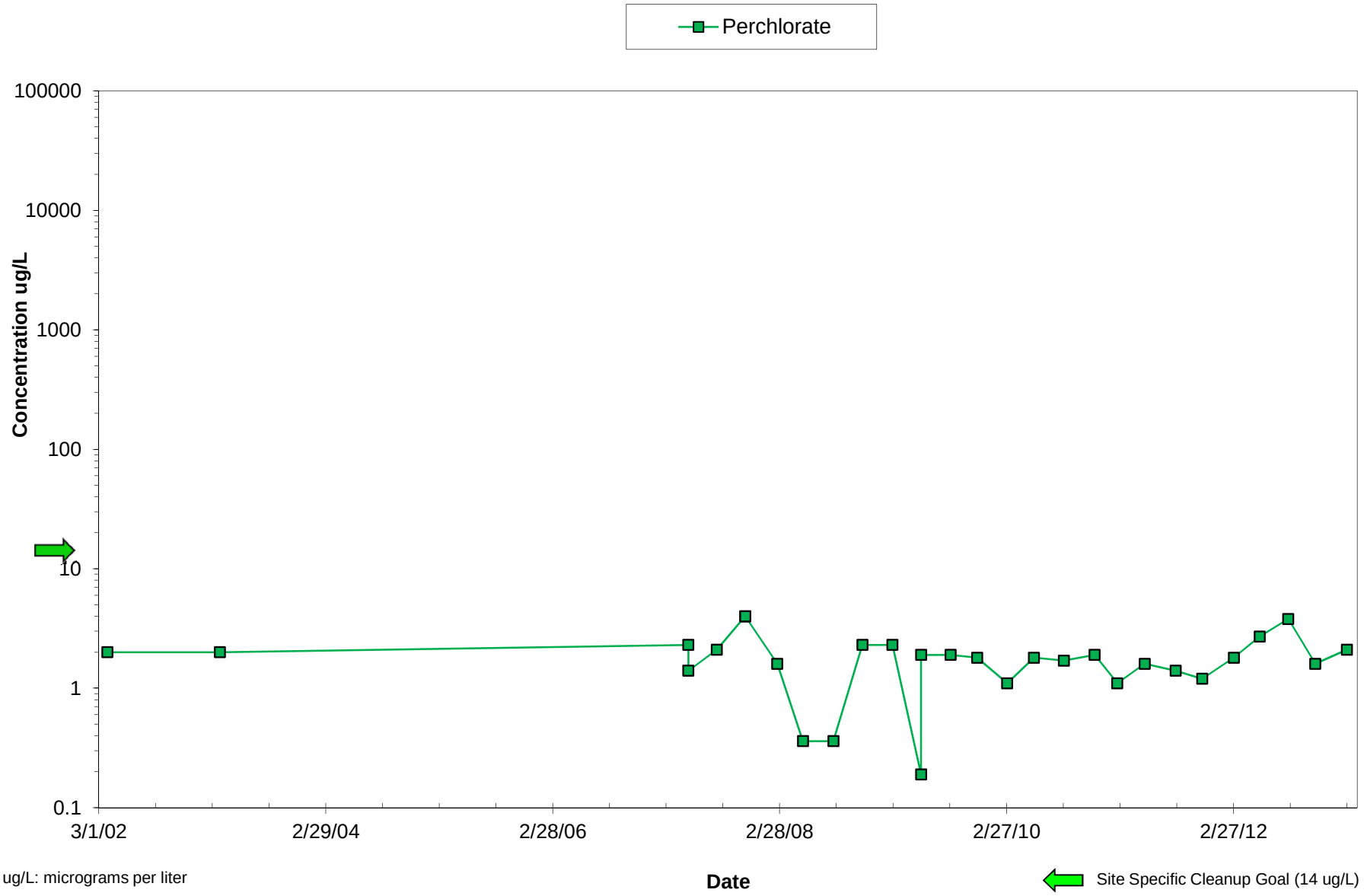
EPA MW-28M
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

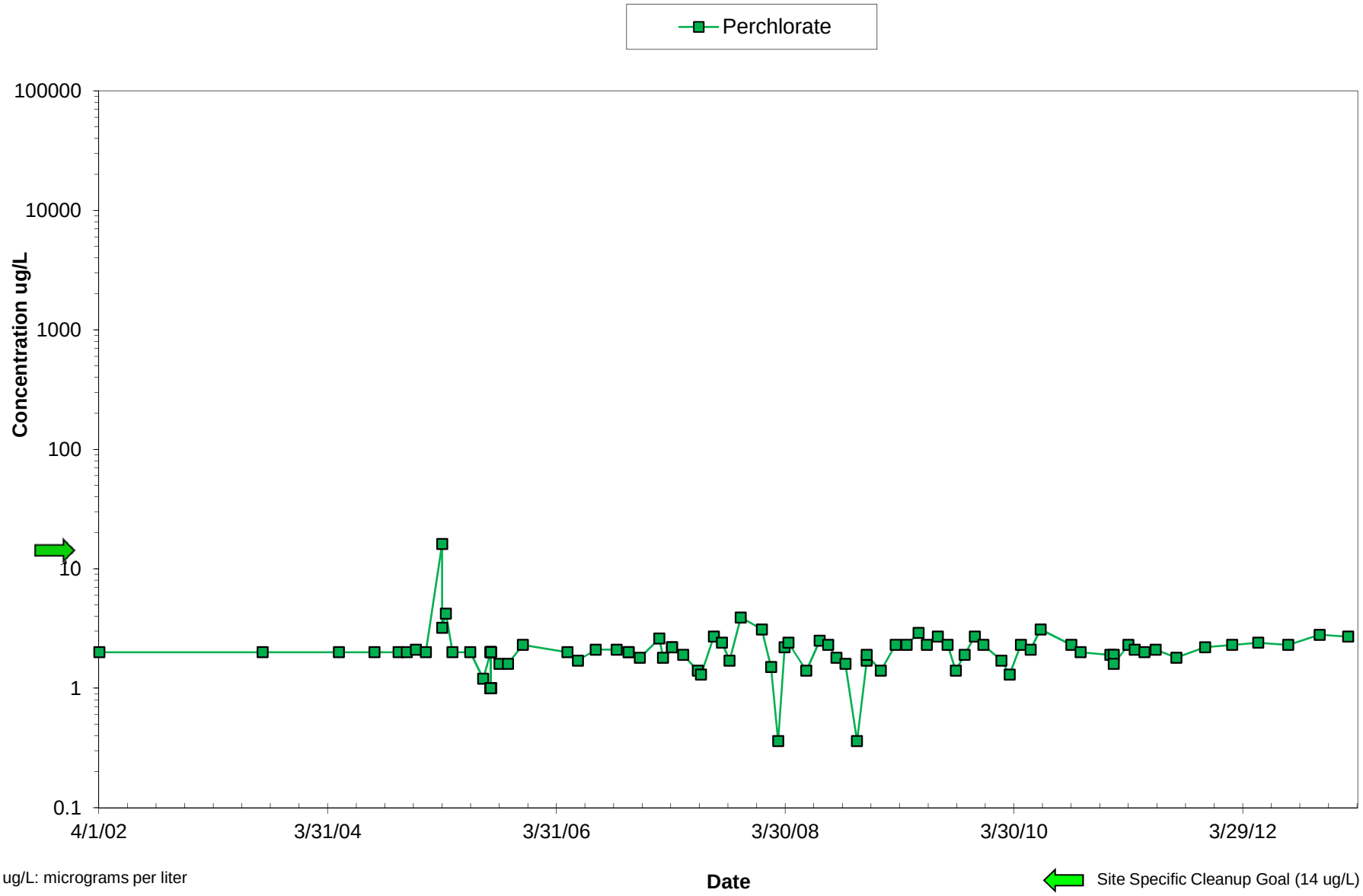
AEIW
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

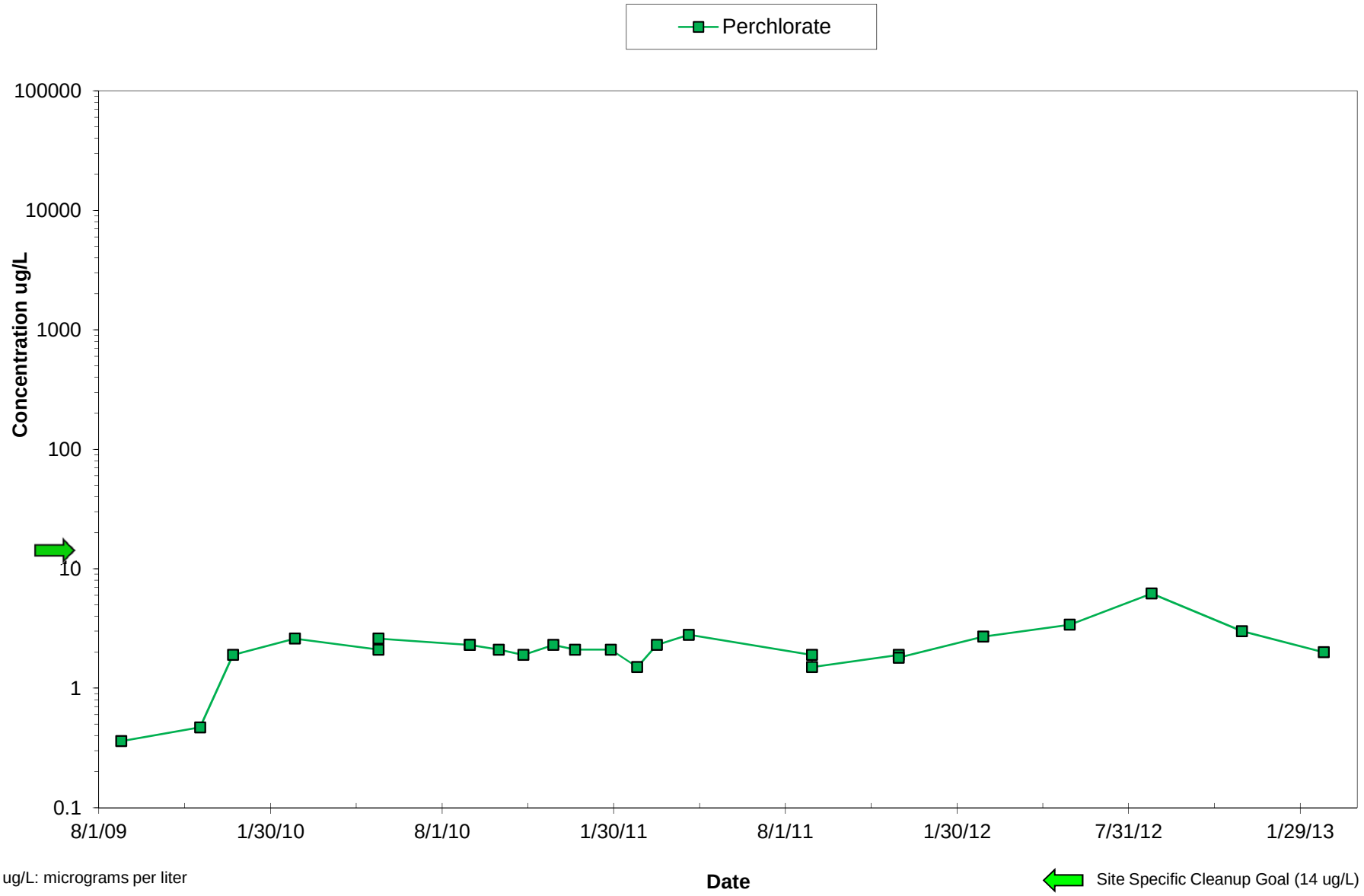
IR-3B
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

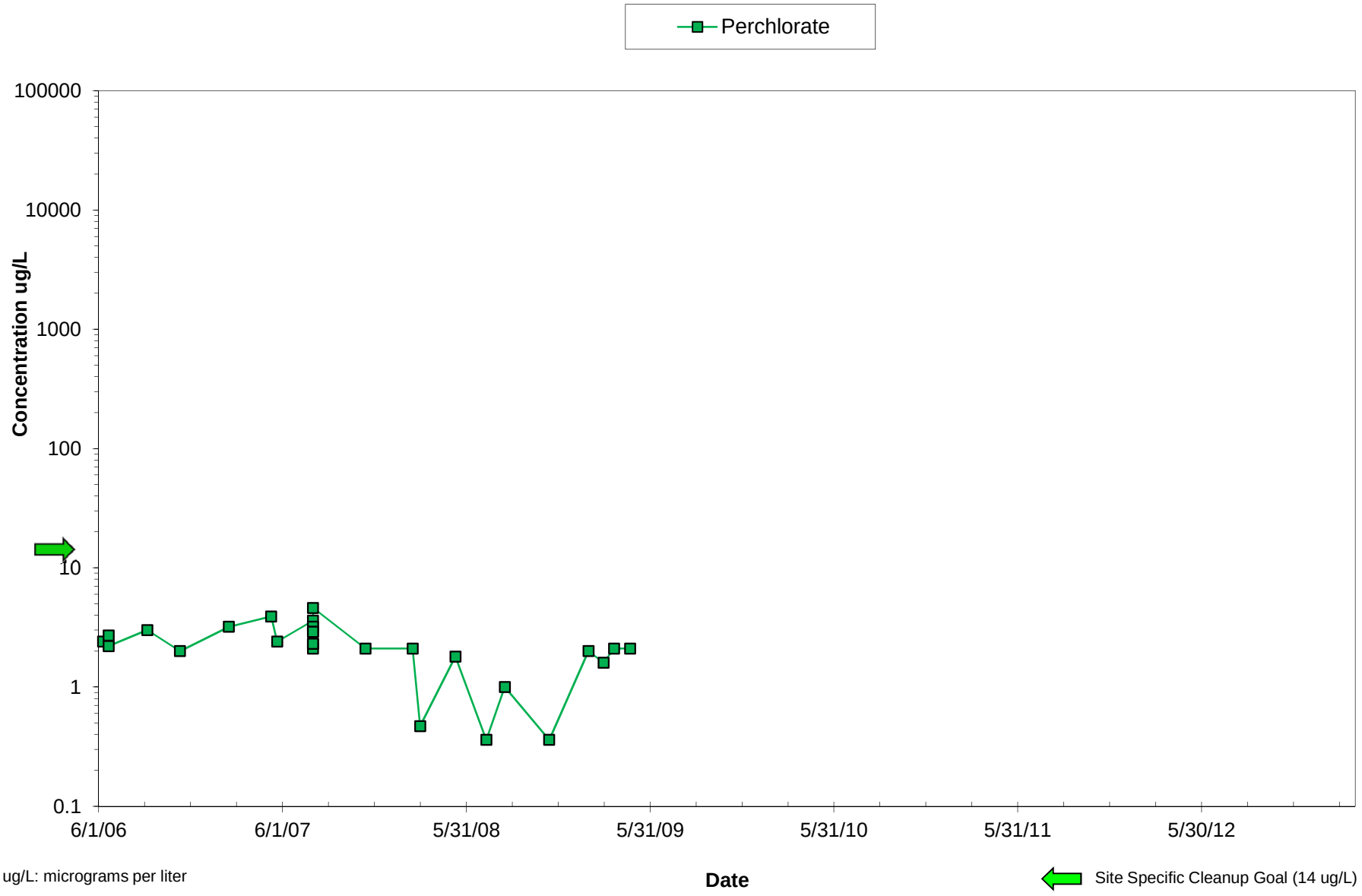
IR-26A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

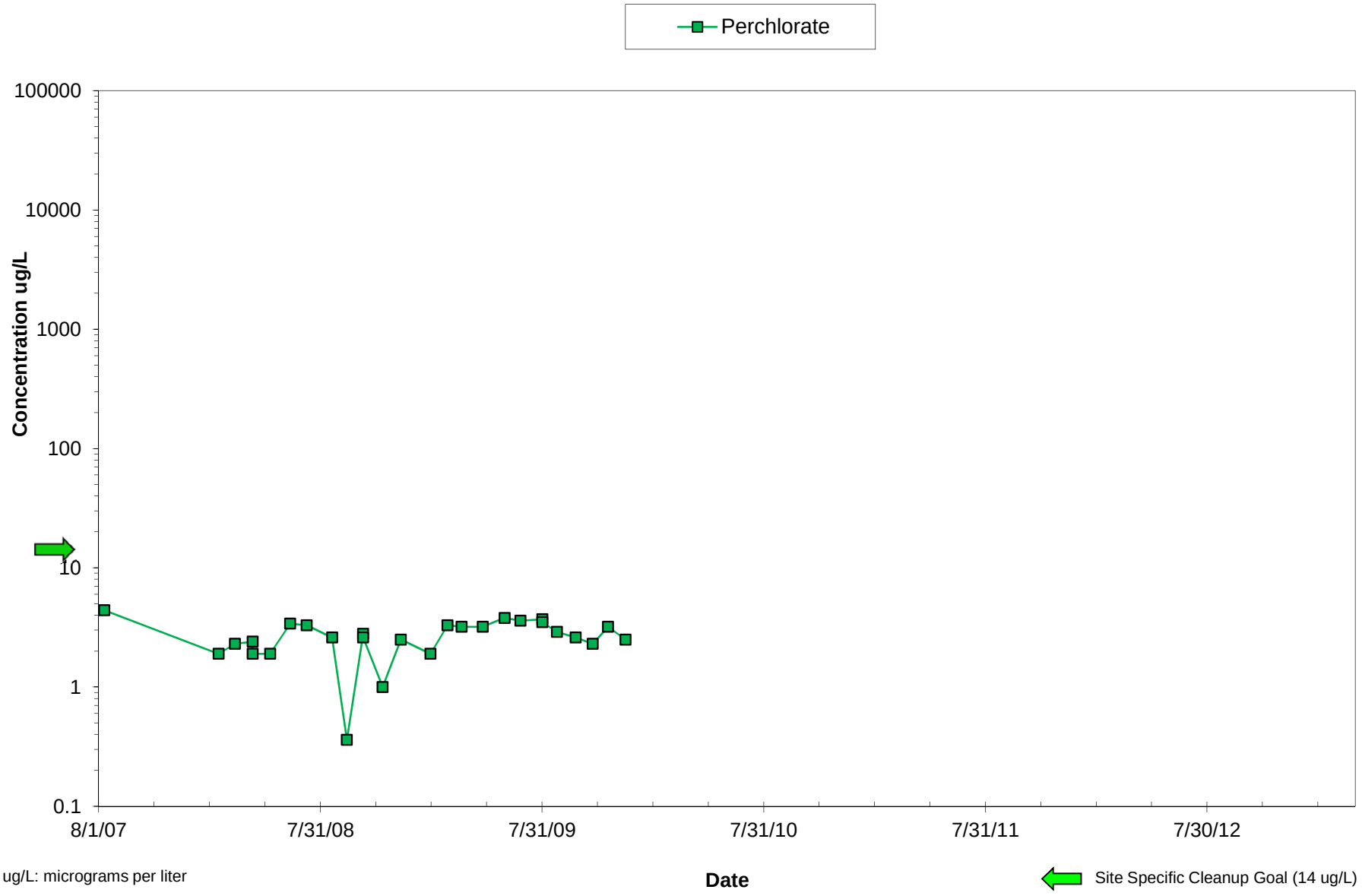
IR-27A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

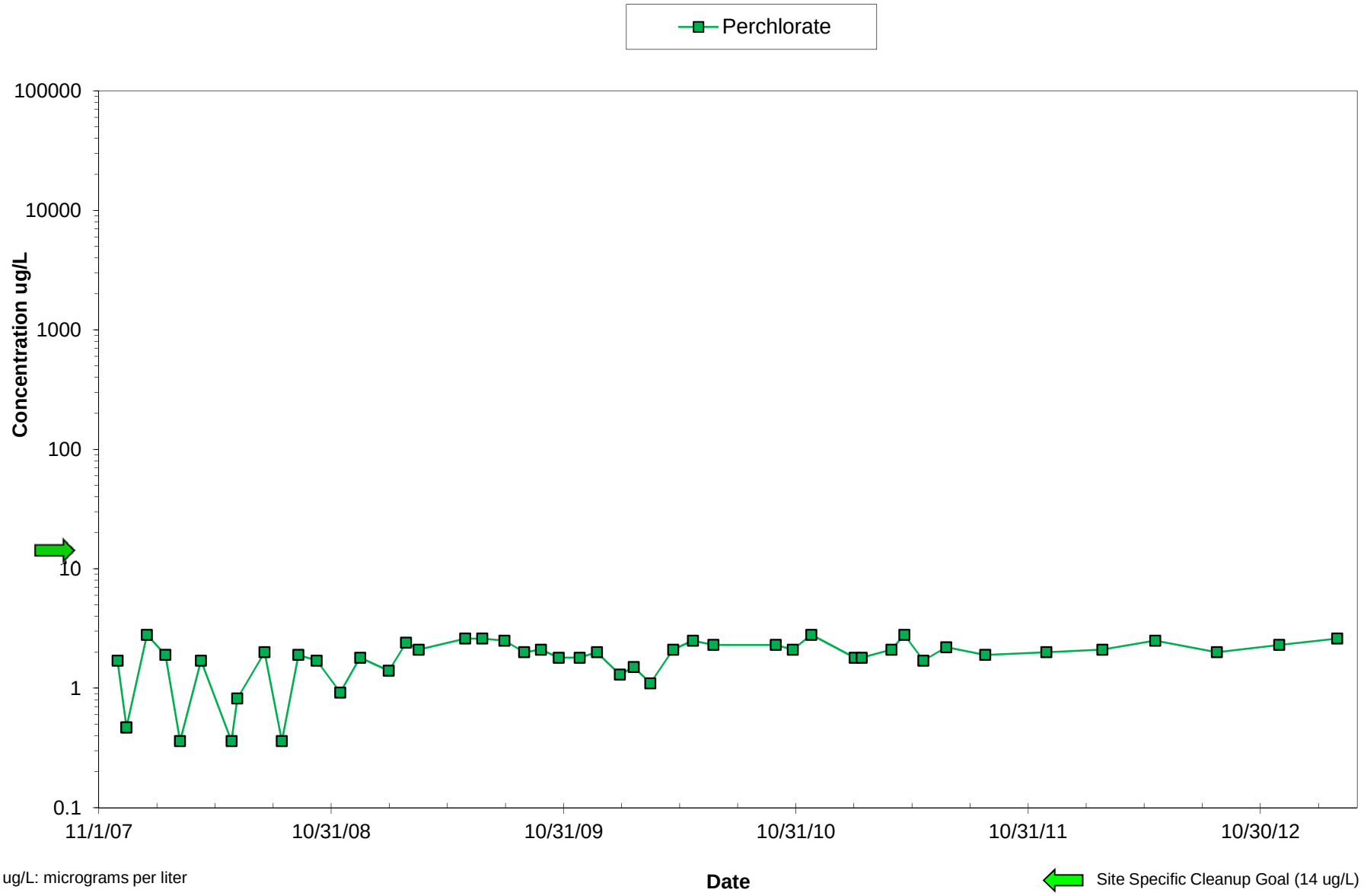
IR-27C
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

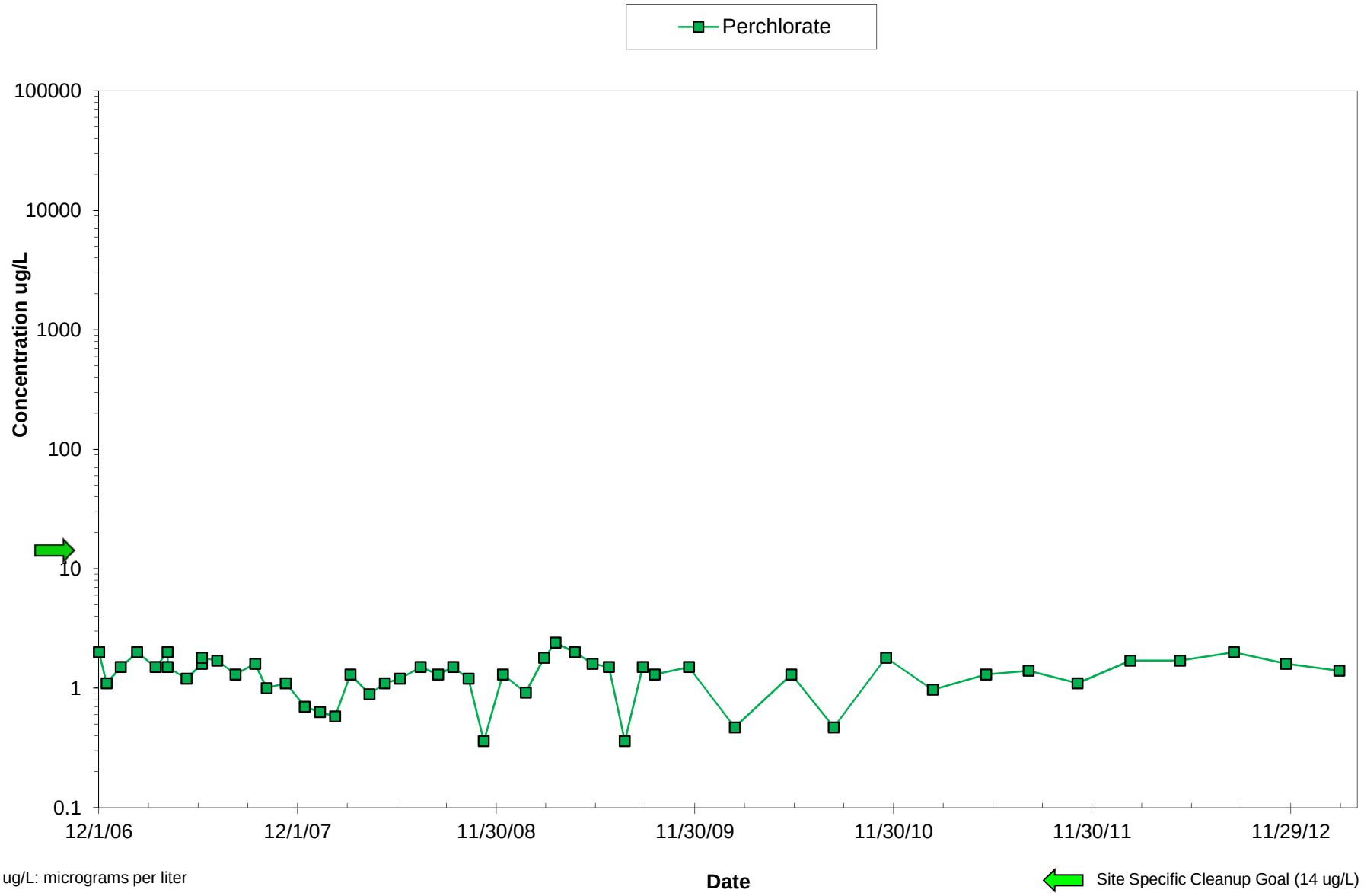
GC LAKE
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

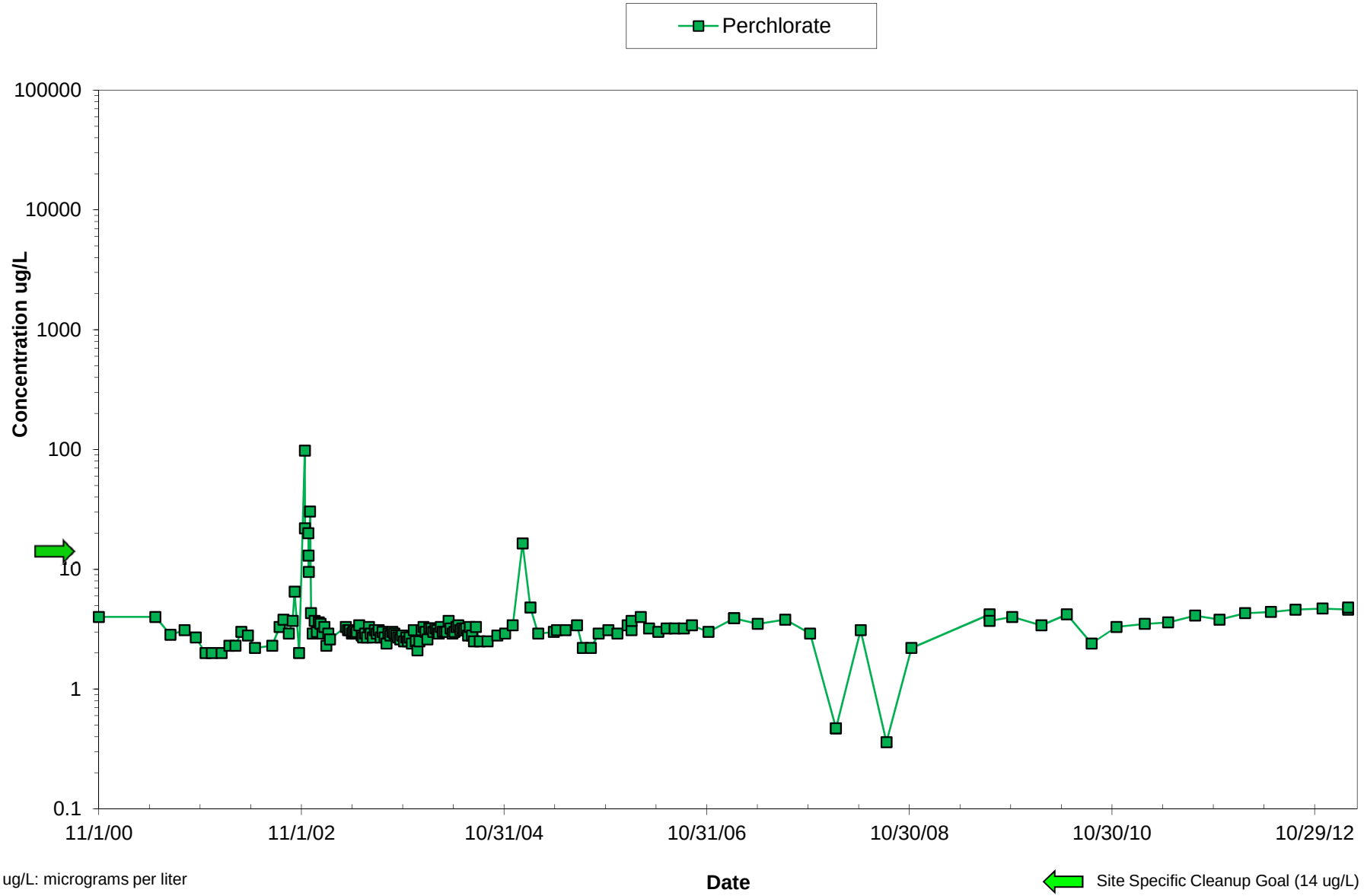
LPW-894
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

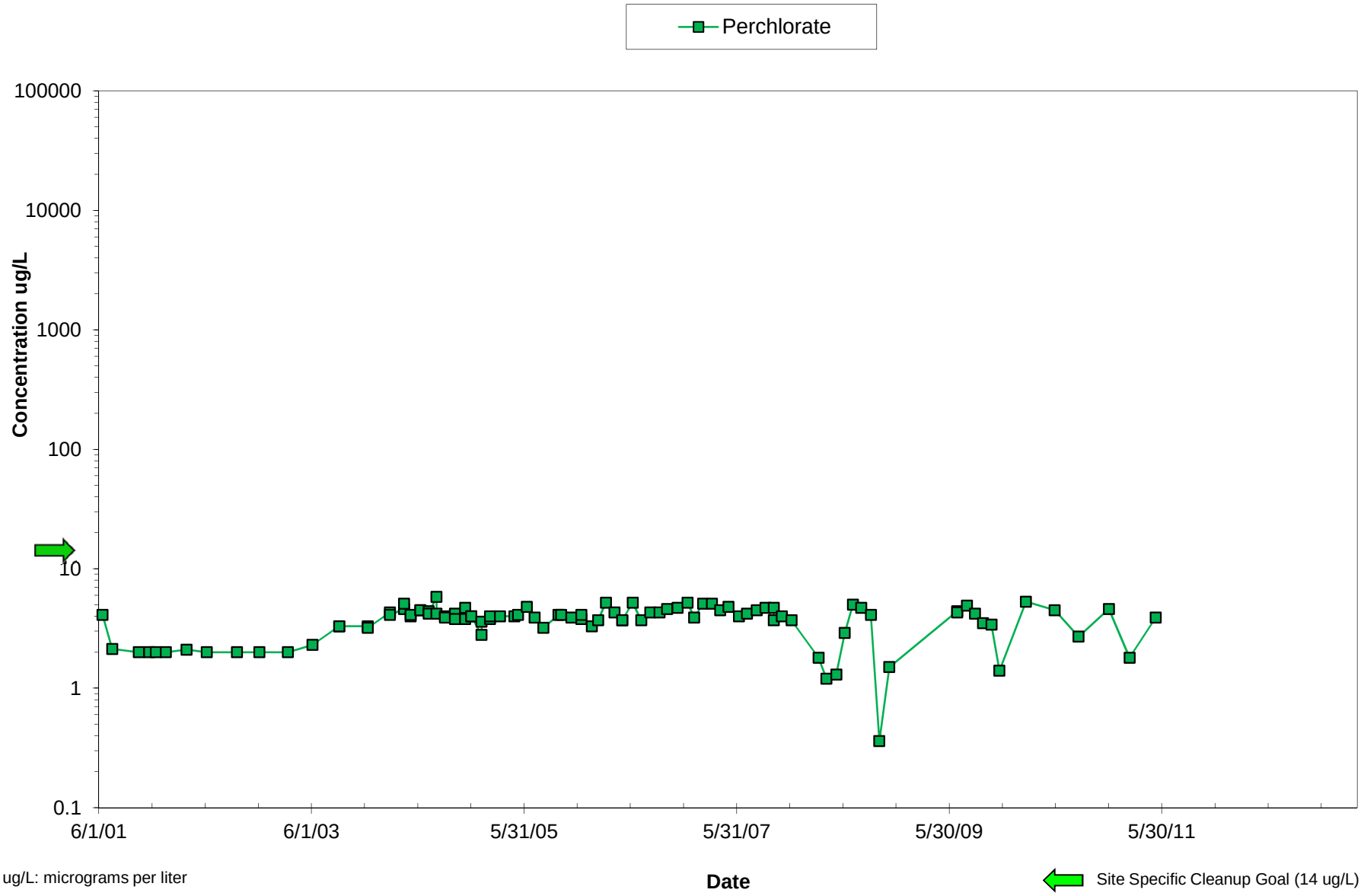
PSDW
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

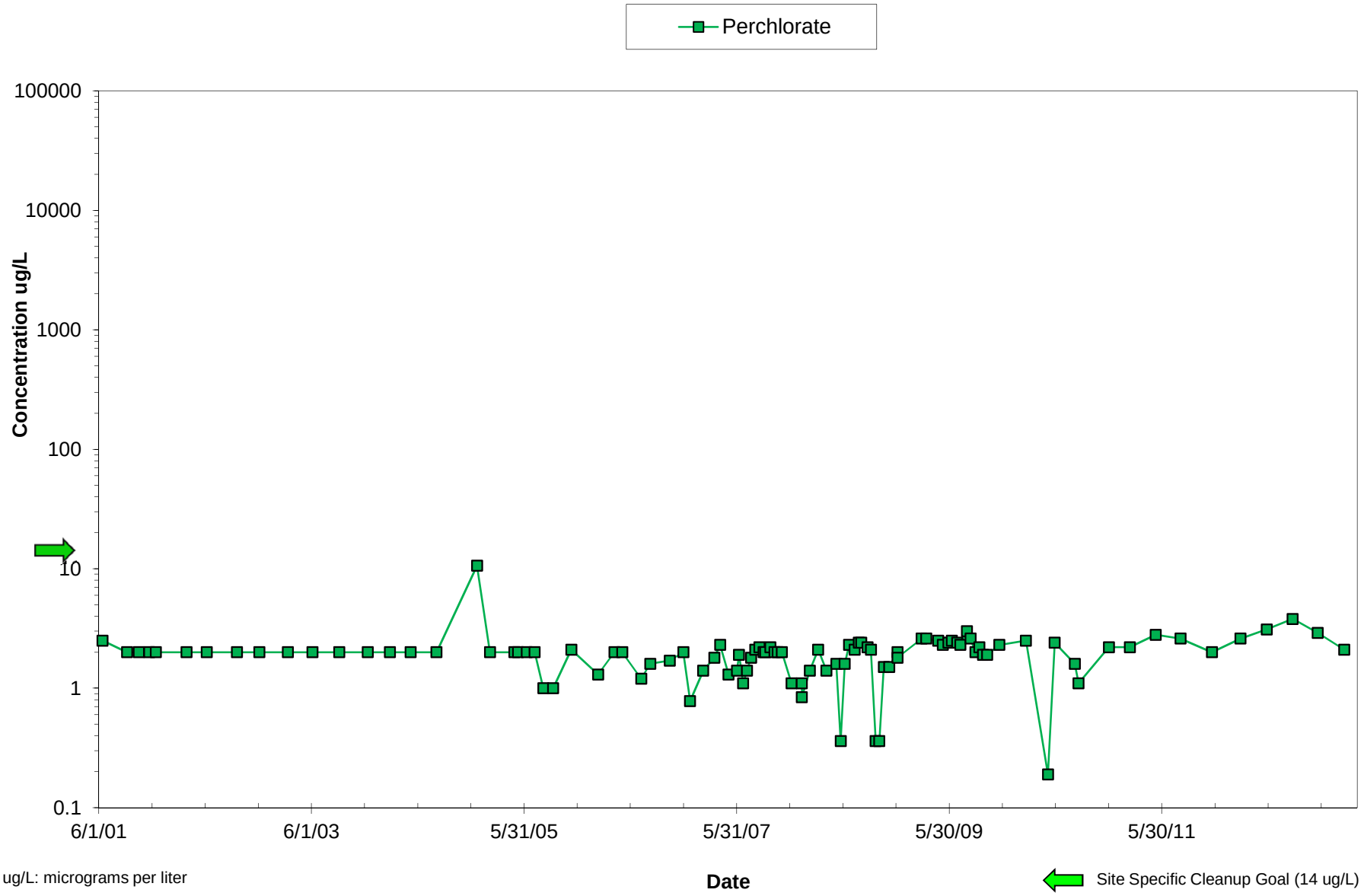
COG-01
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

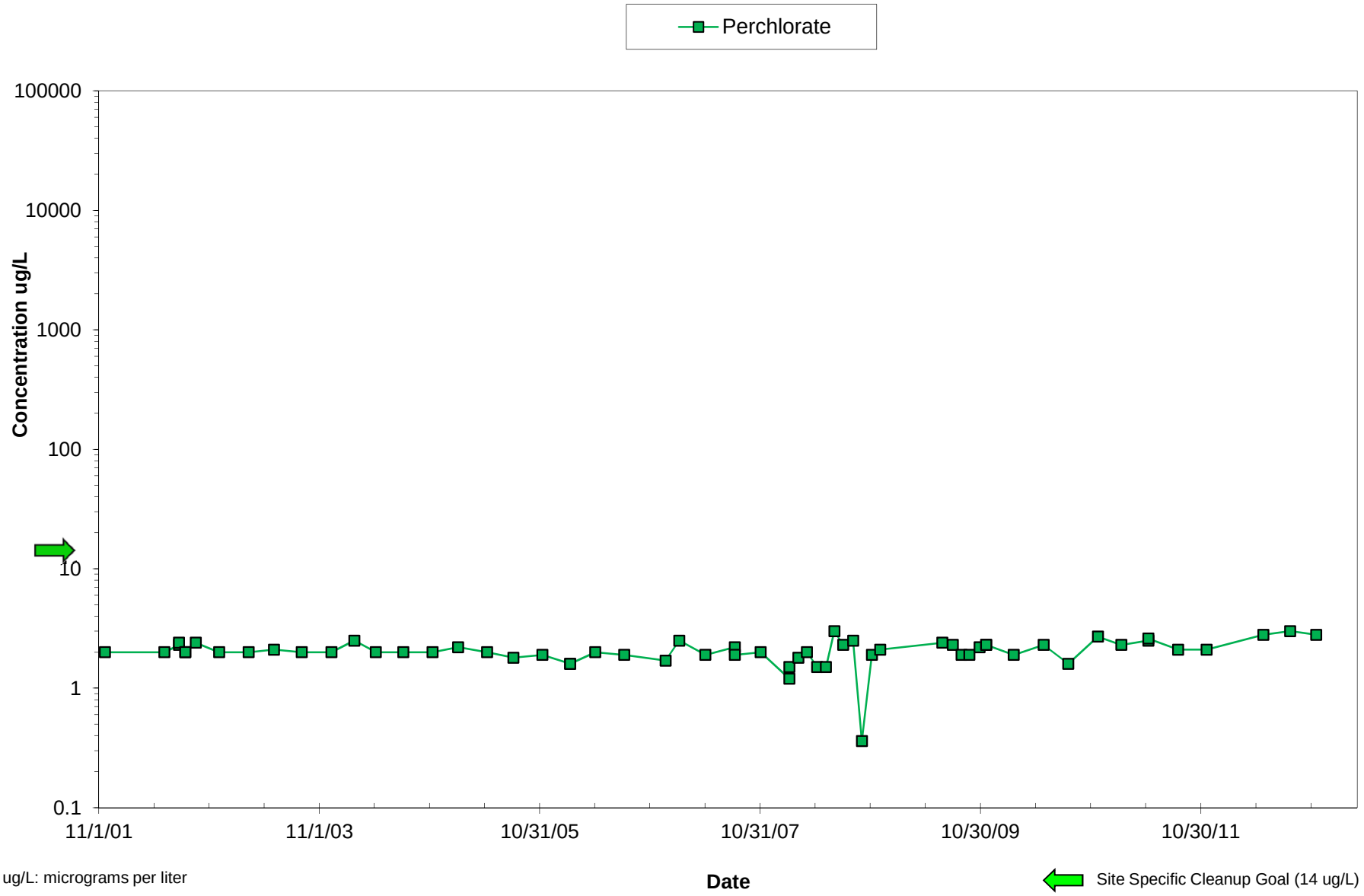
COG-03
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

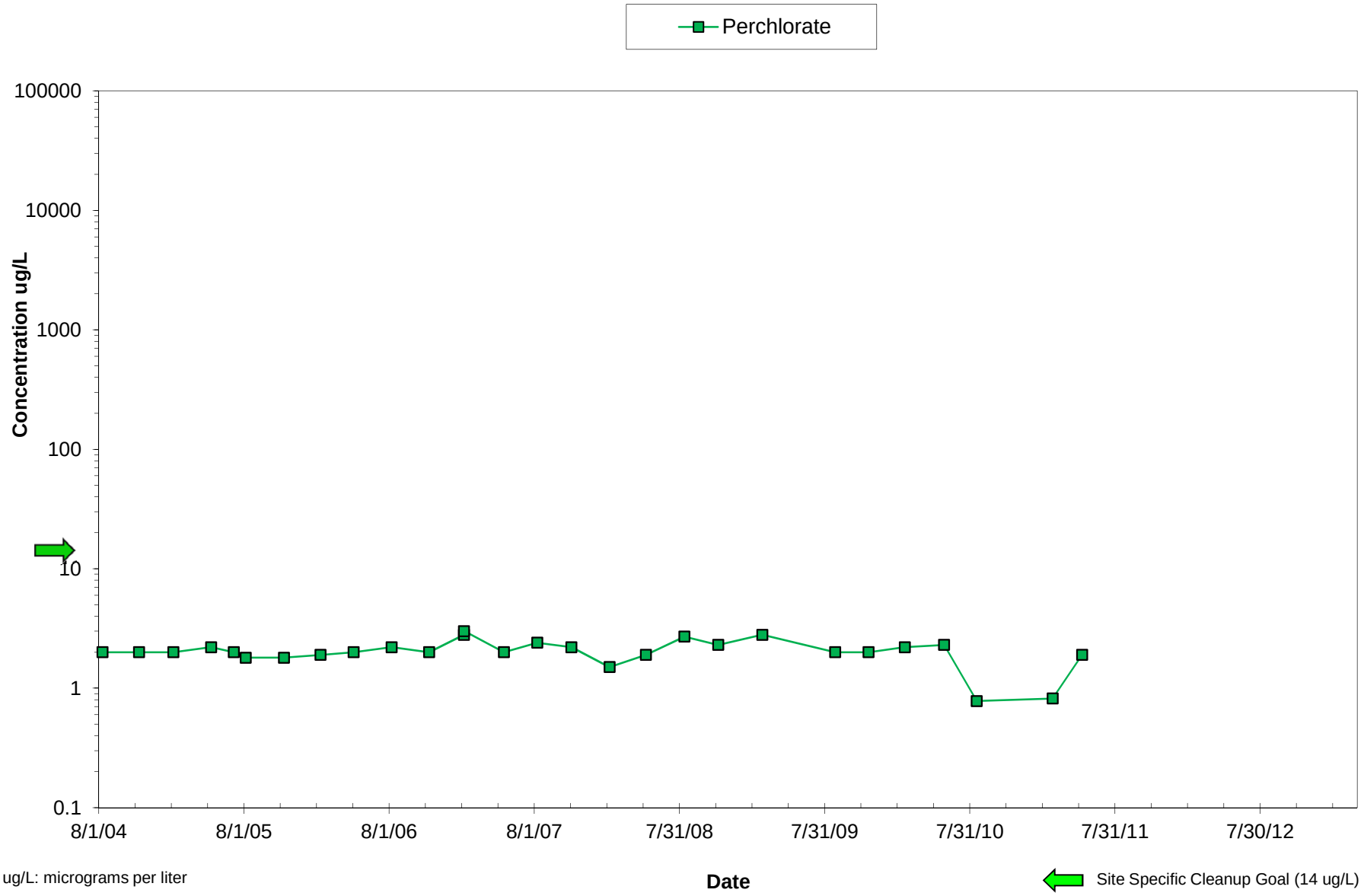
COG-06
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

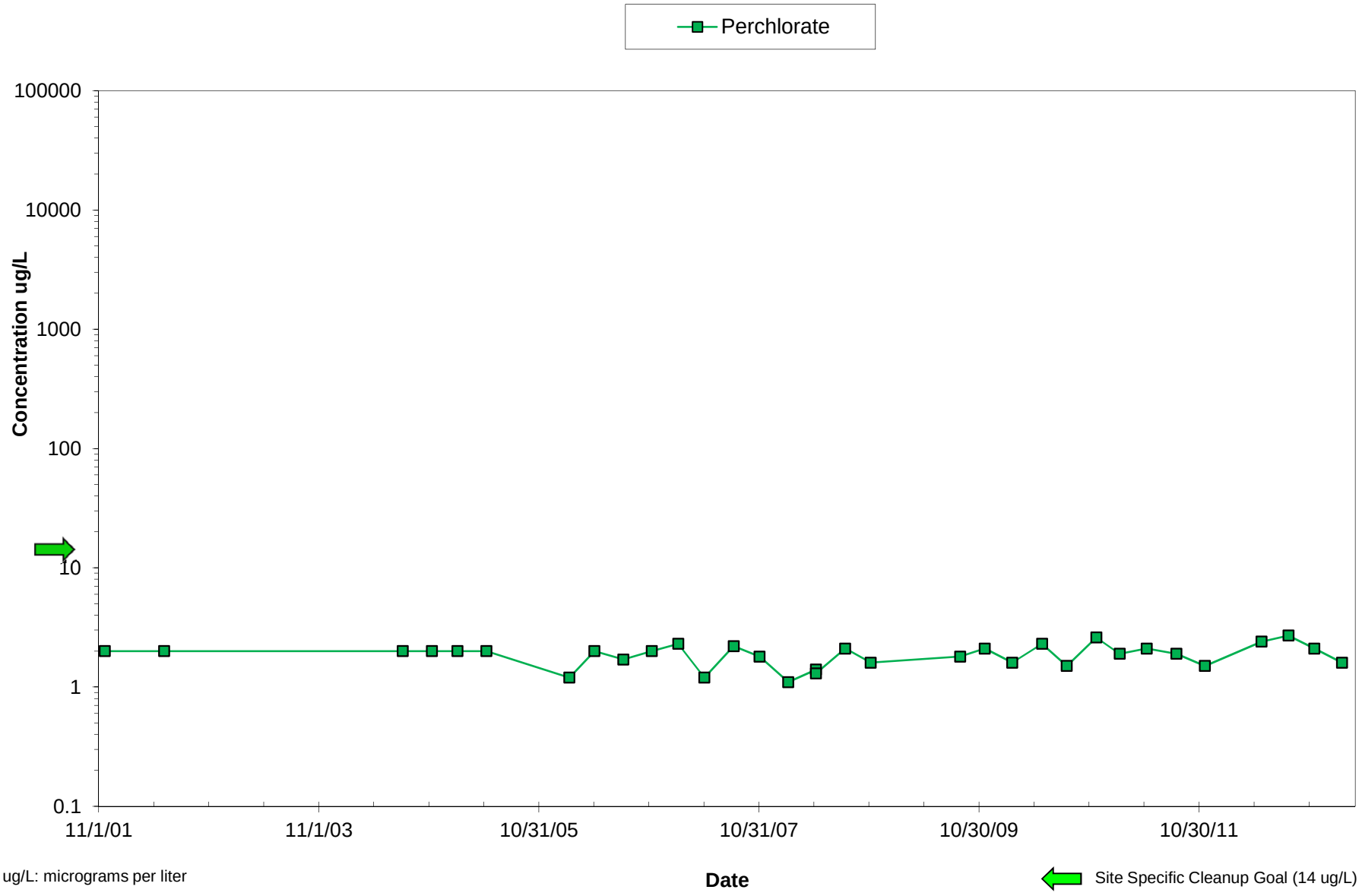
COG-11
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

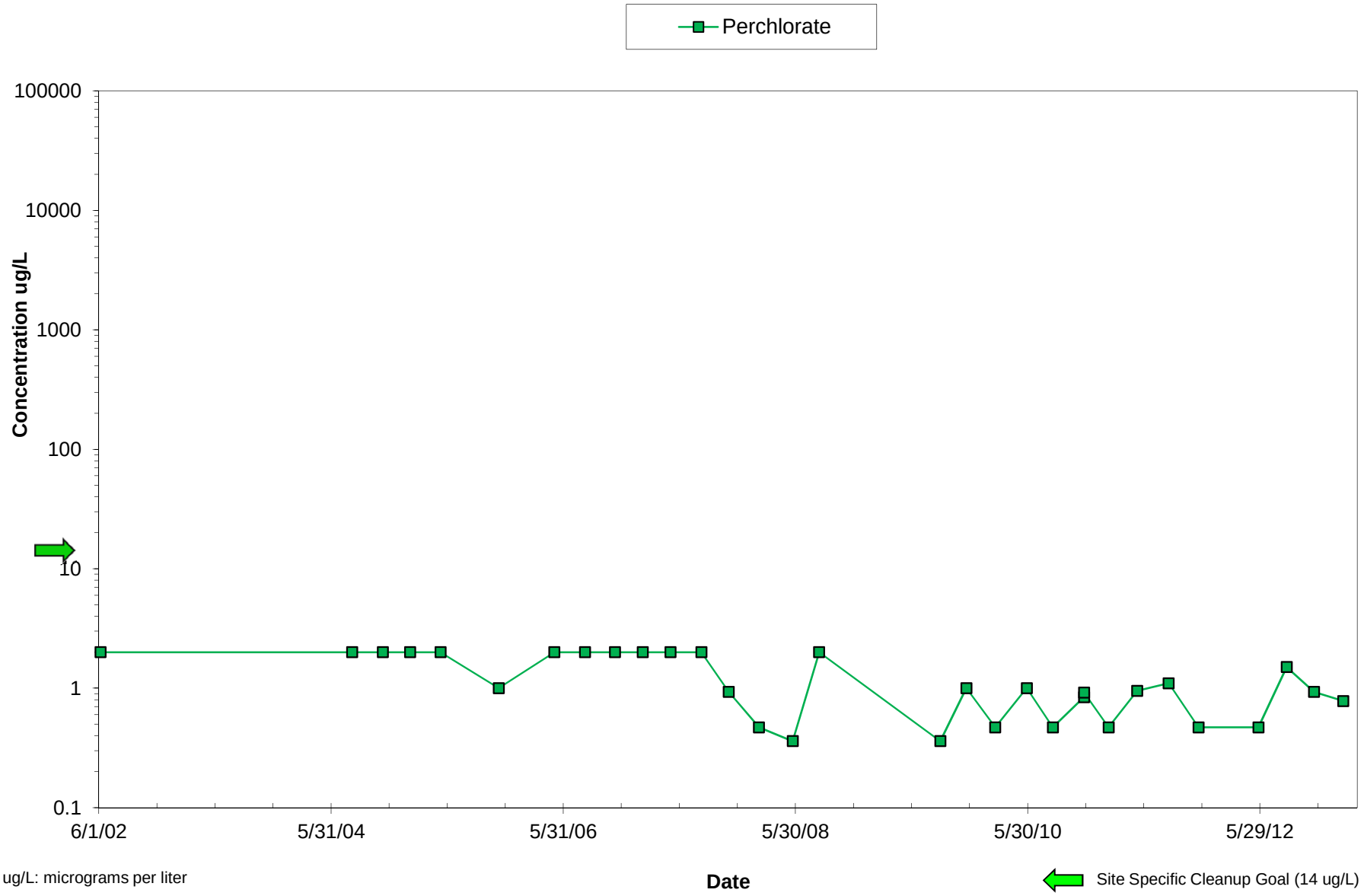
COG-18A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

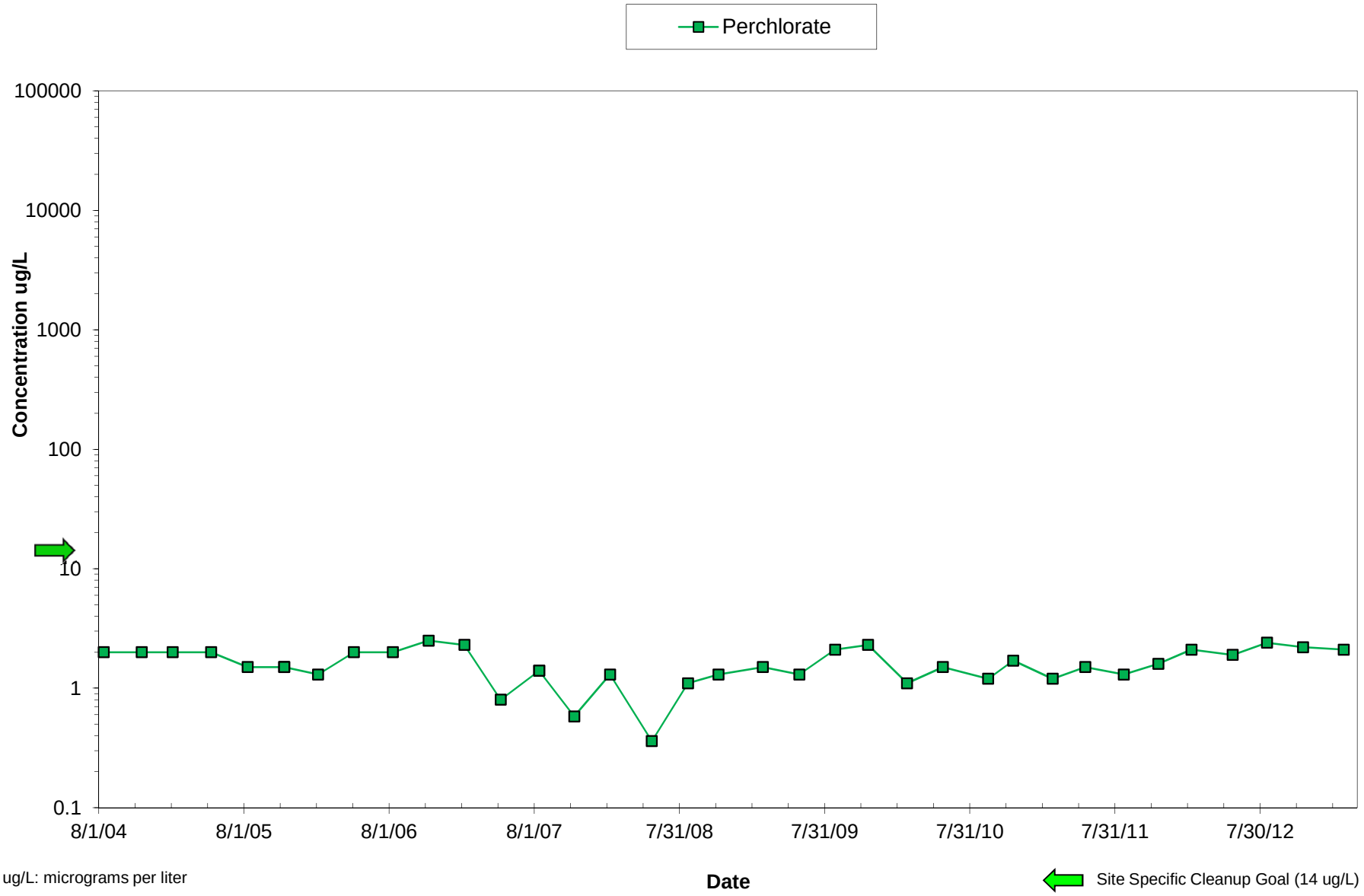
COG-18B
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

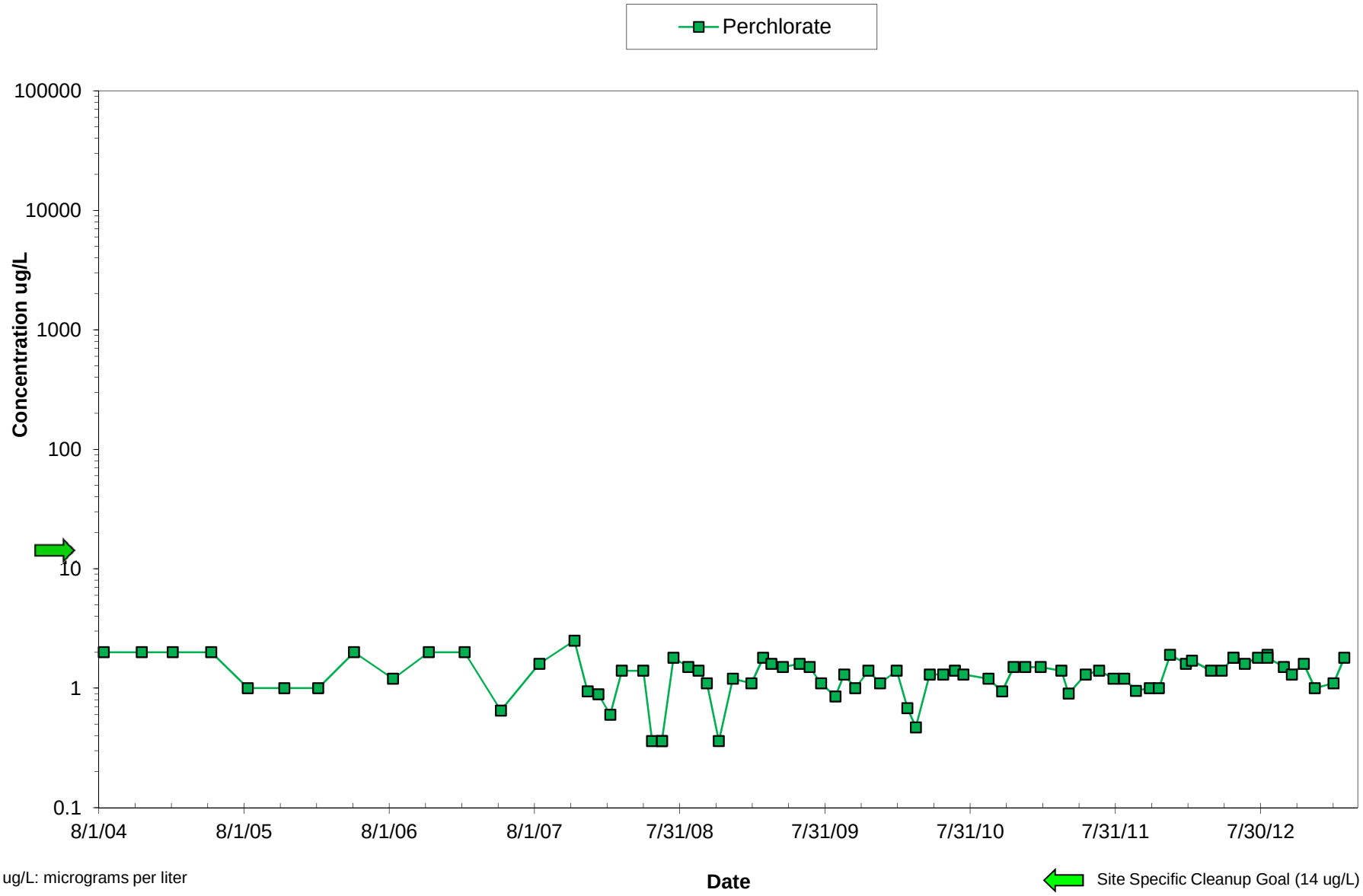
COA-15
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

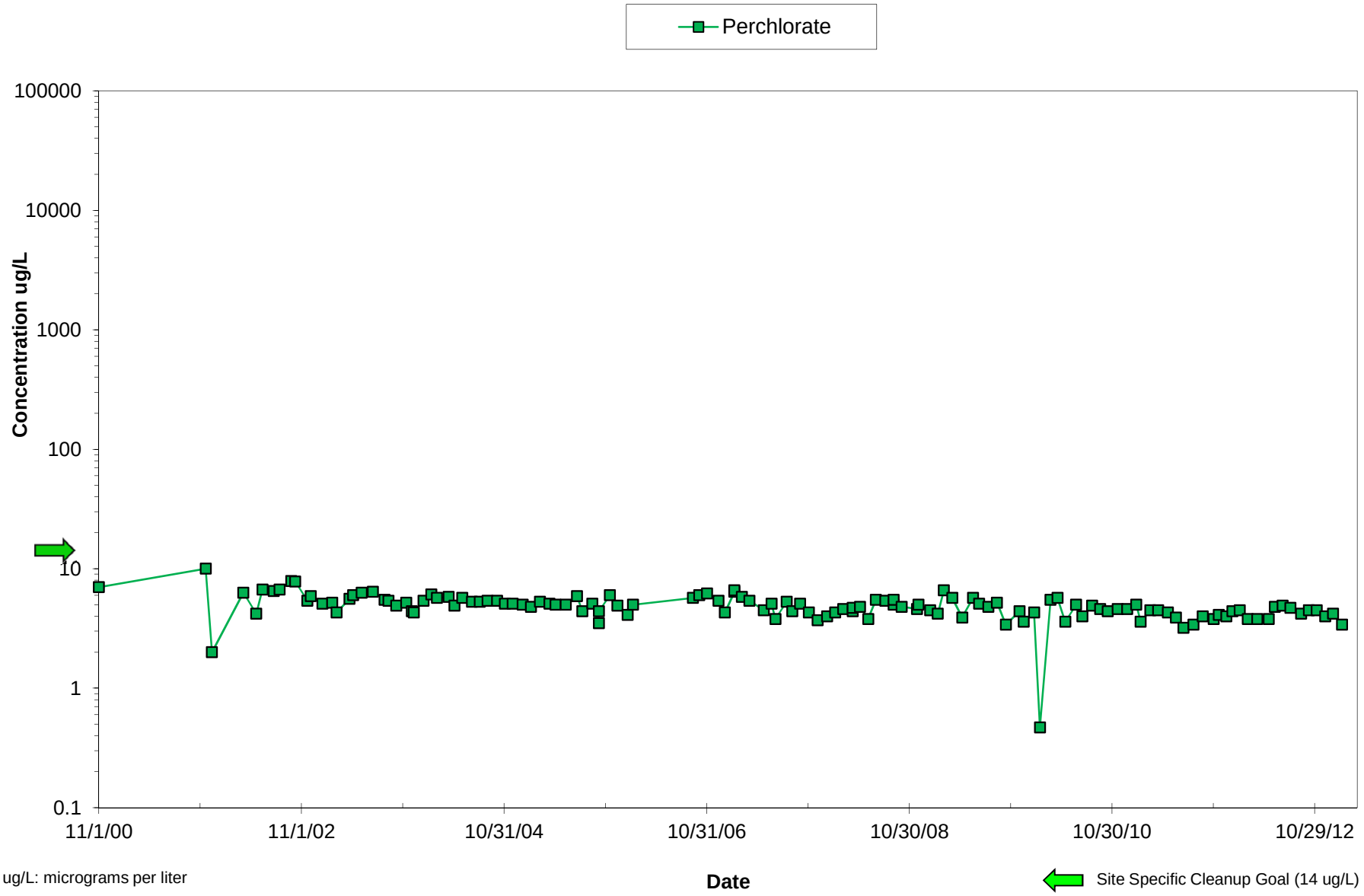
COA-18
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

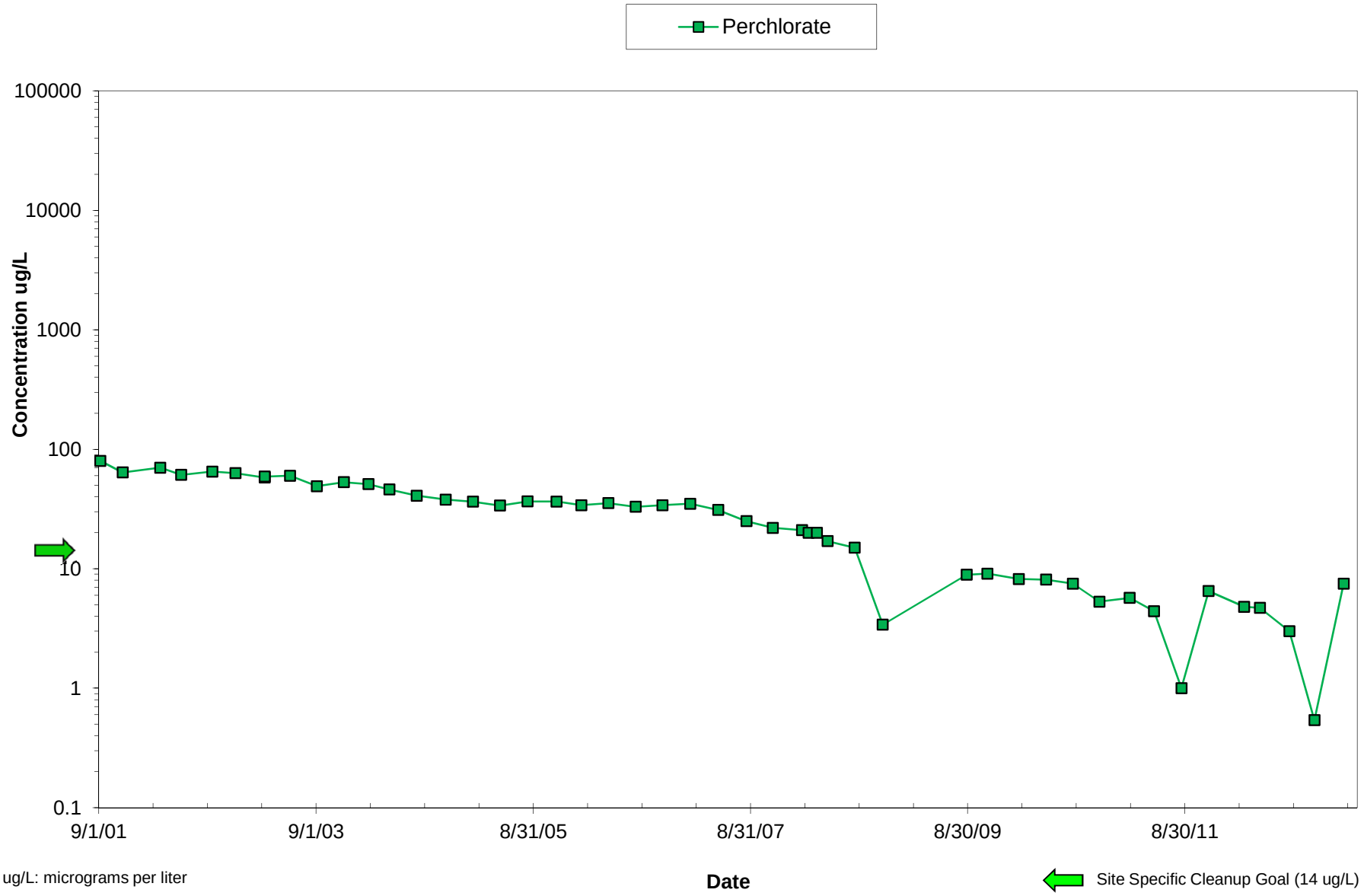
33A
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

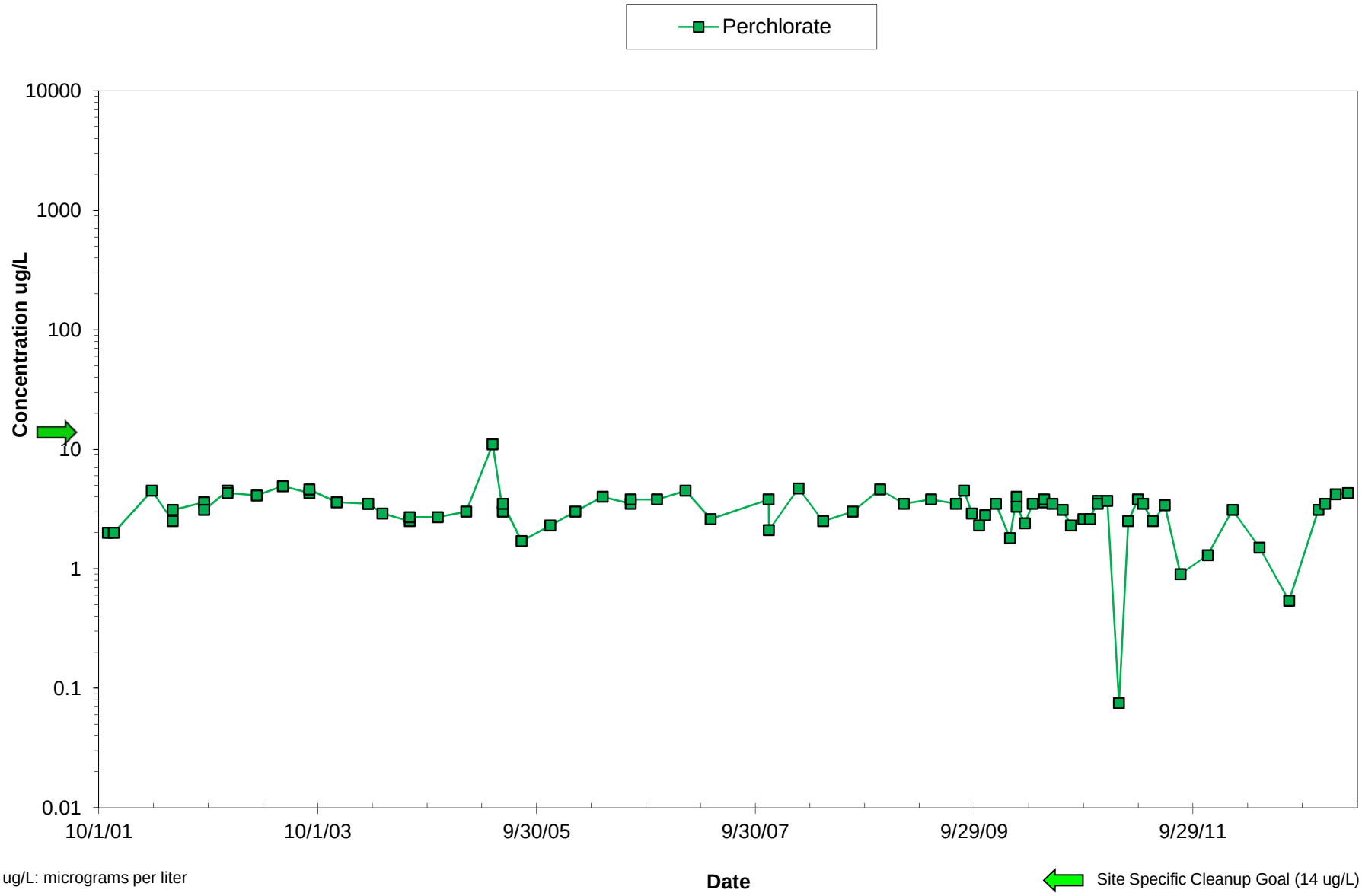
EA-01
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

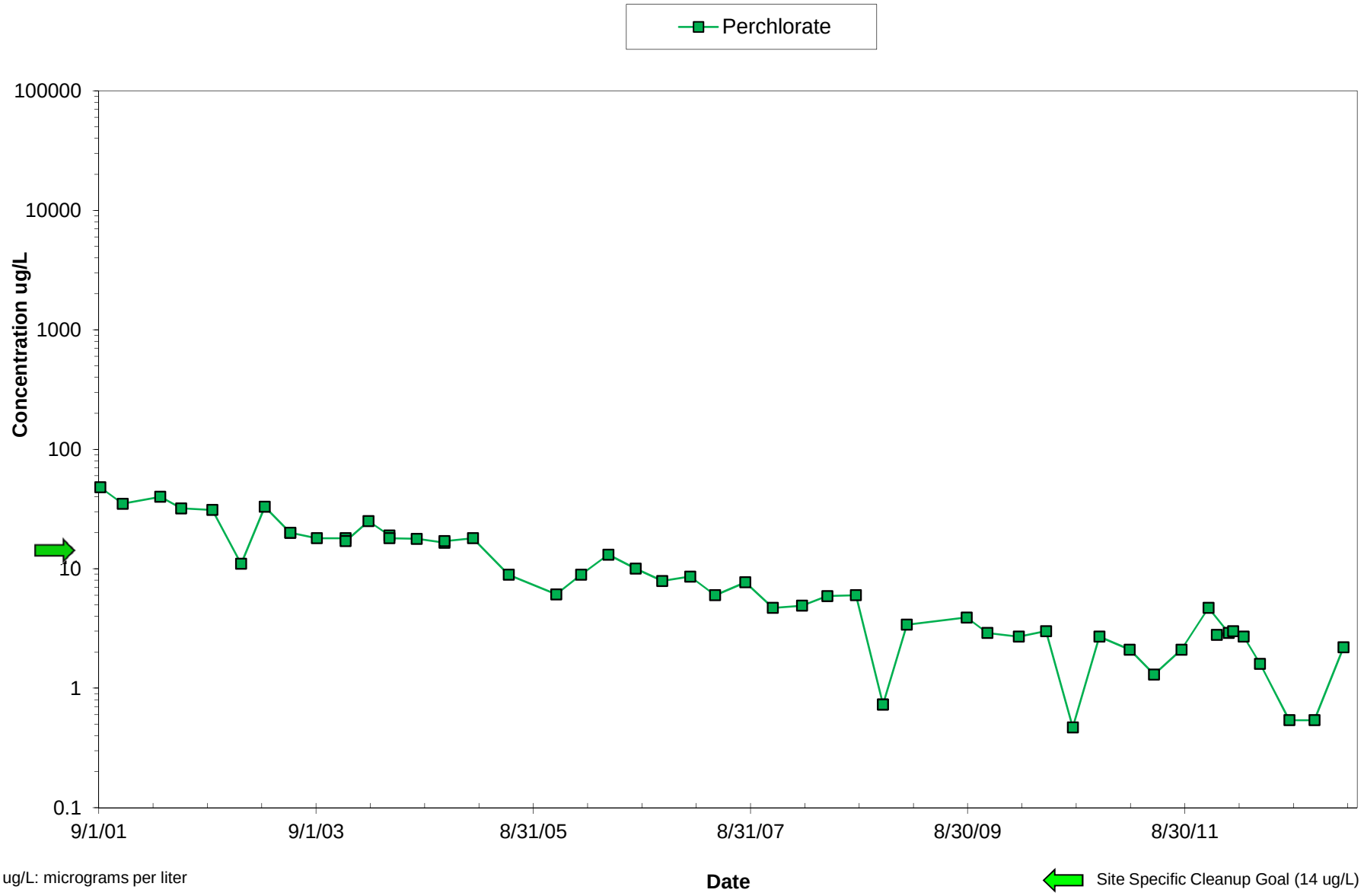
EA-02
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

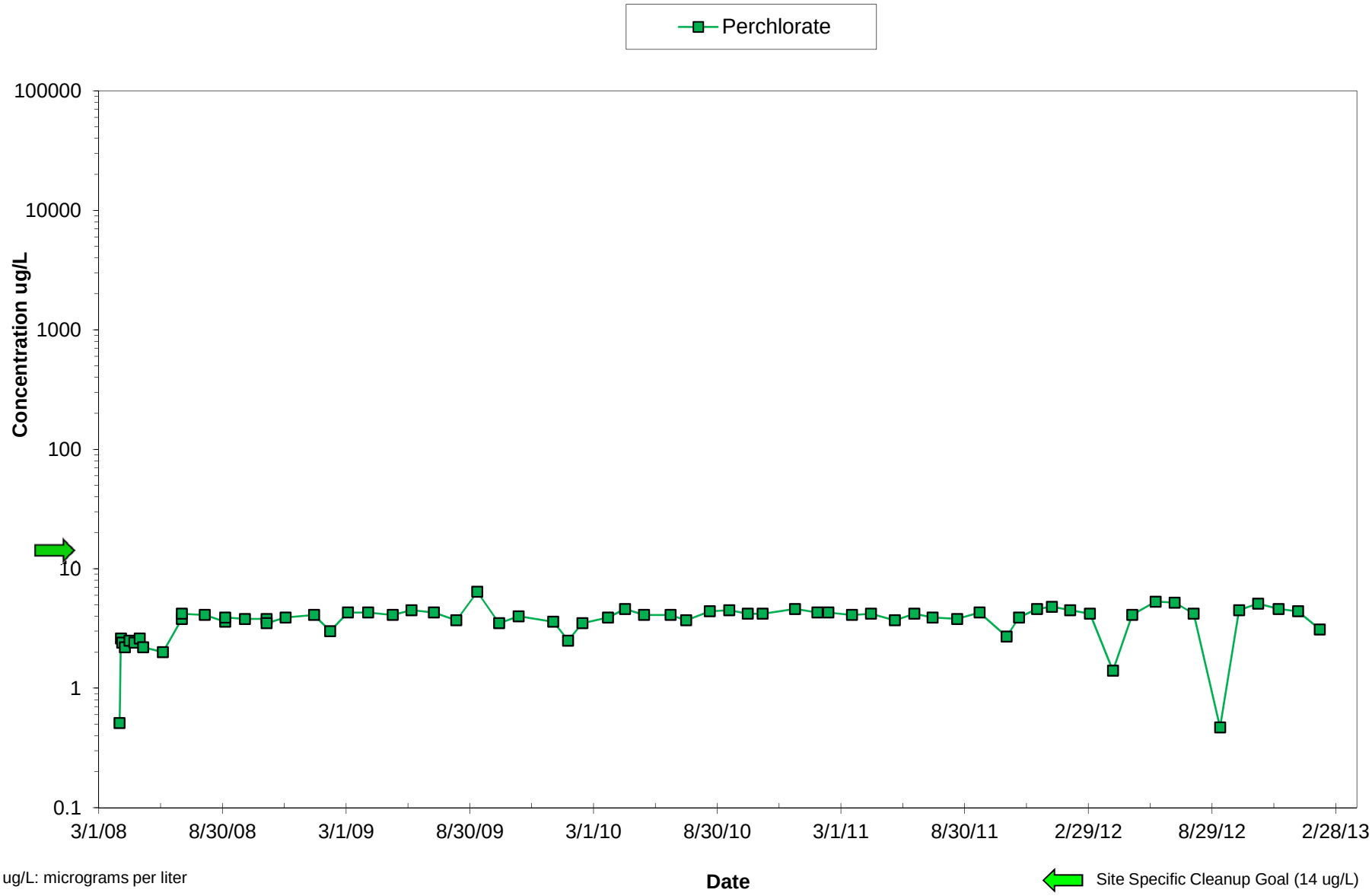
EA-03
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

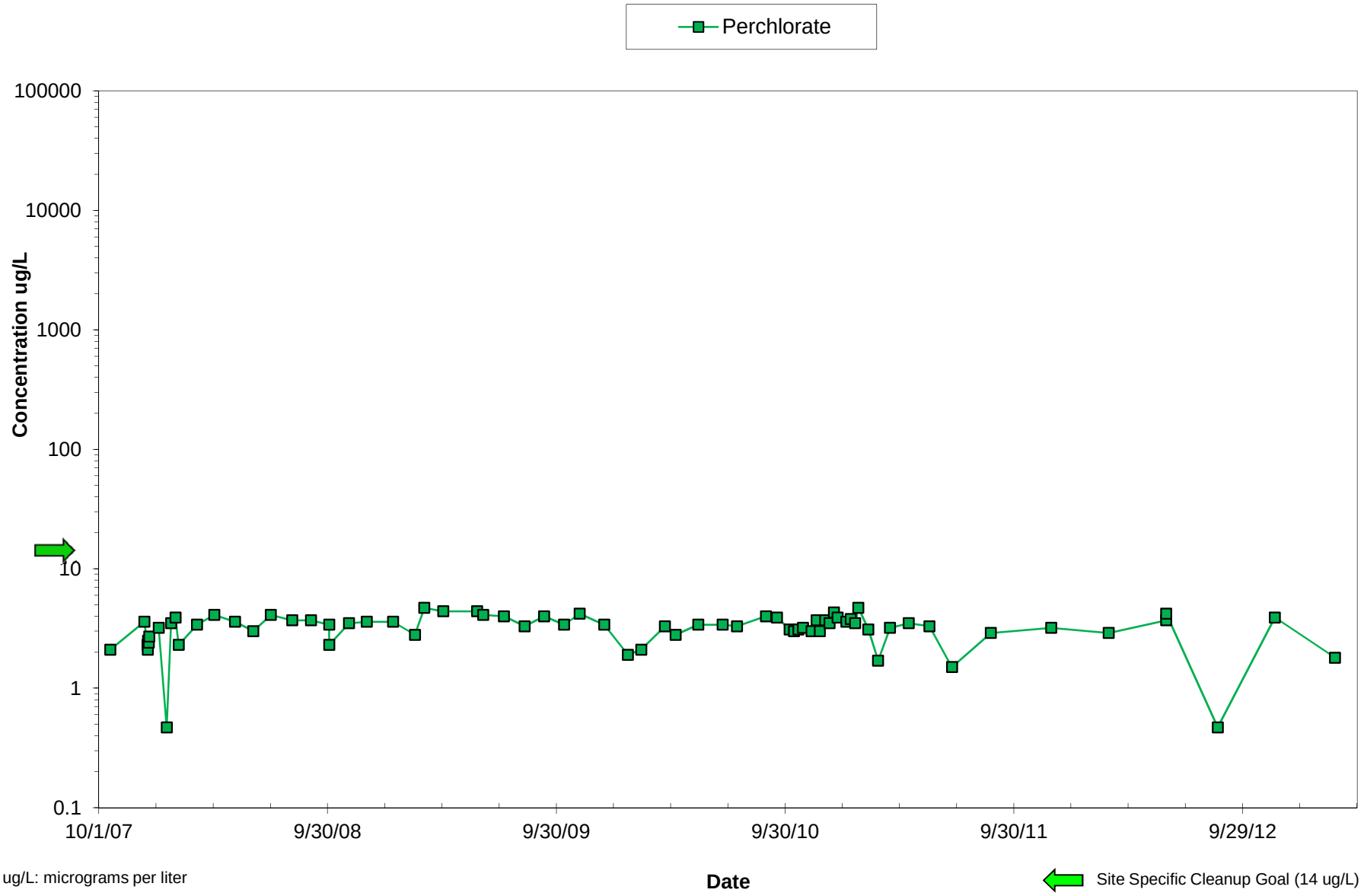
EA-05
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

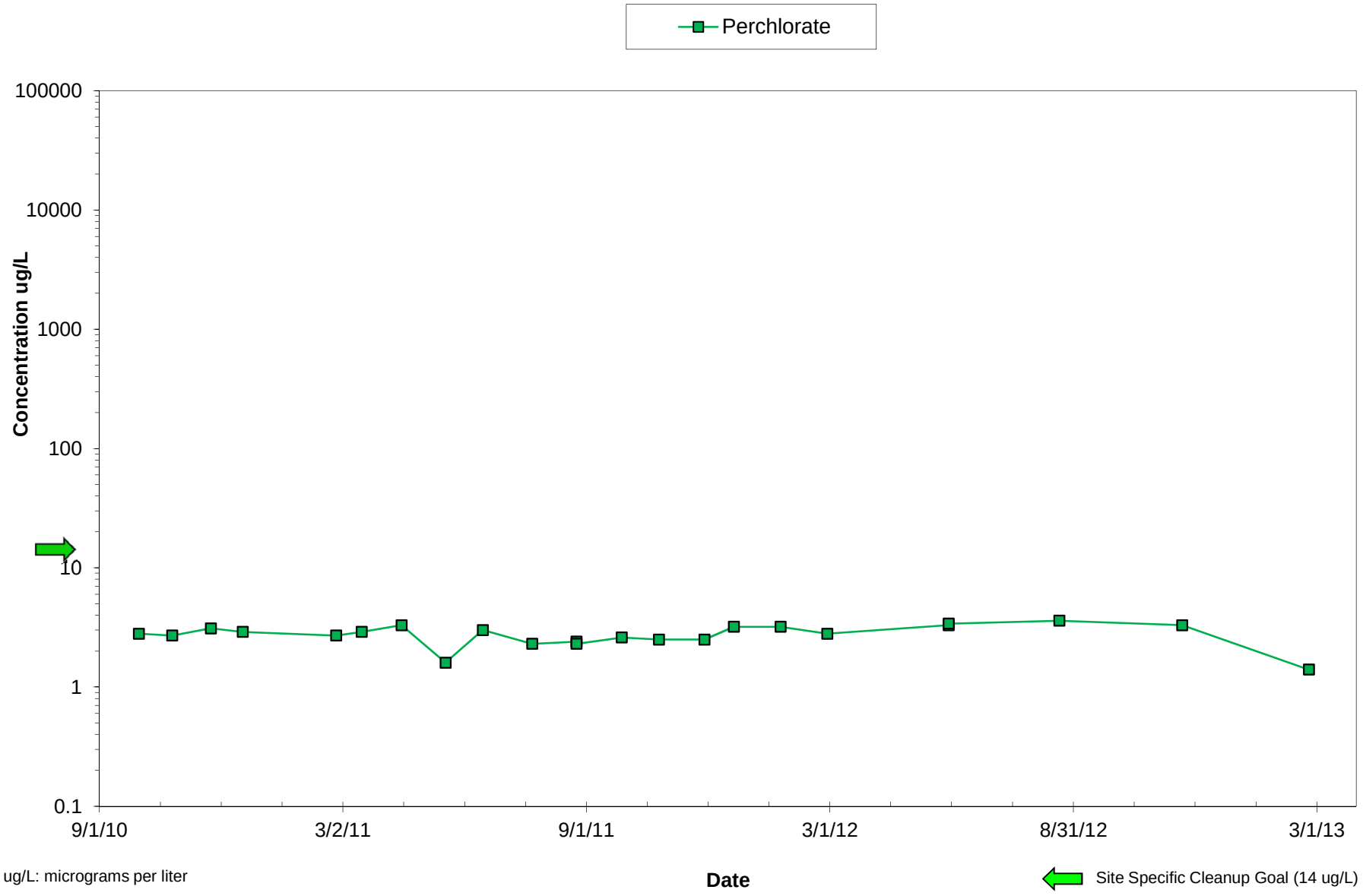
EA-06
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

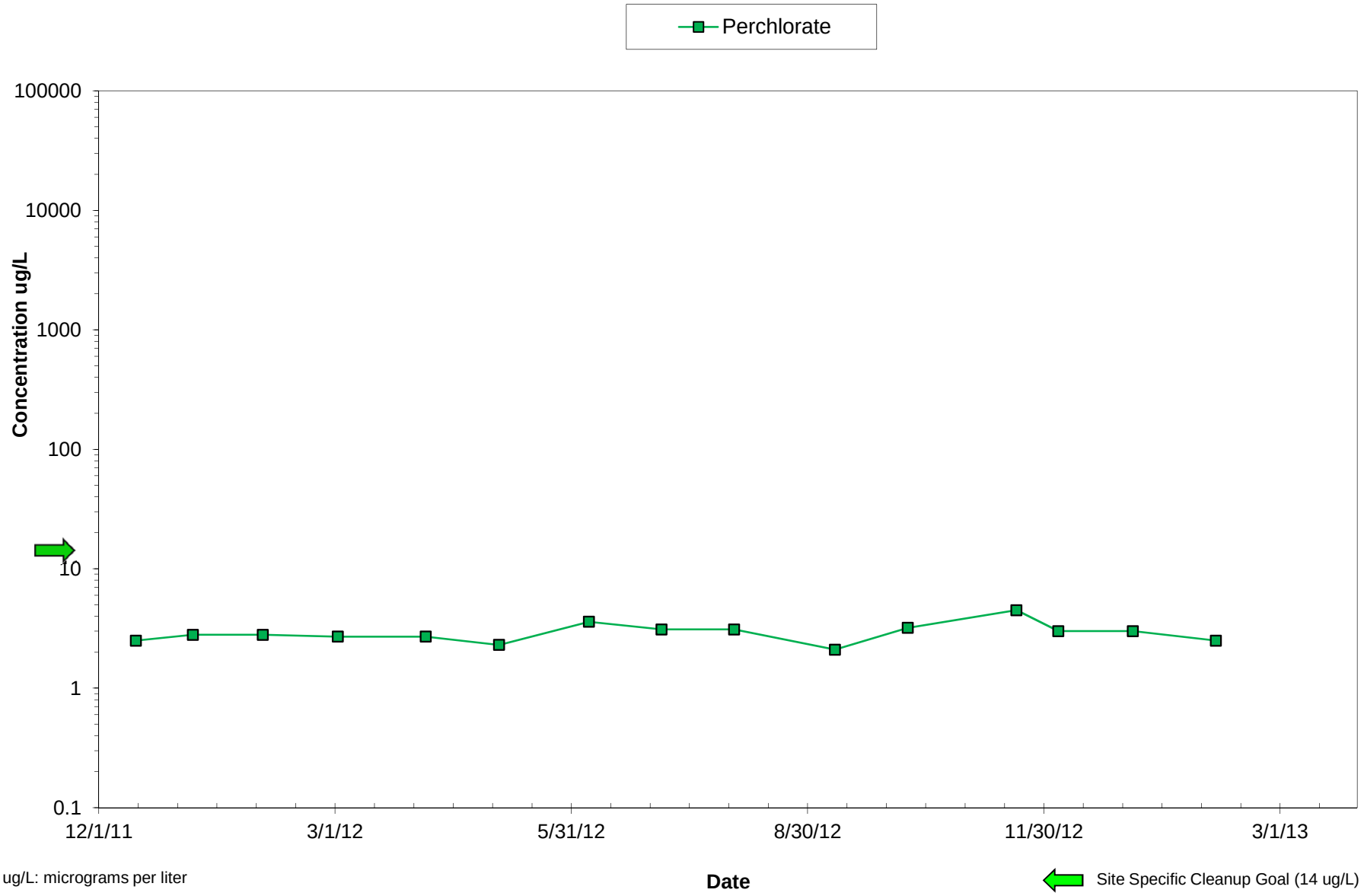
EA-07
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

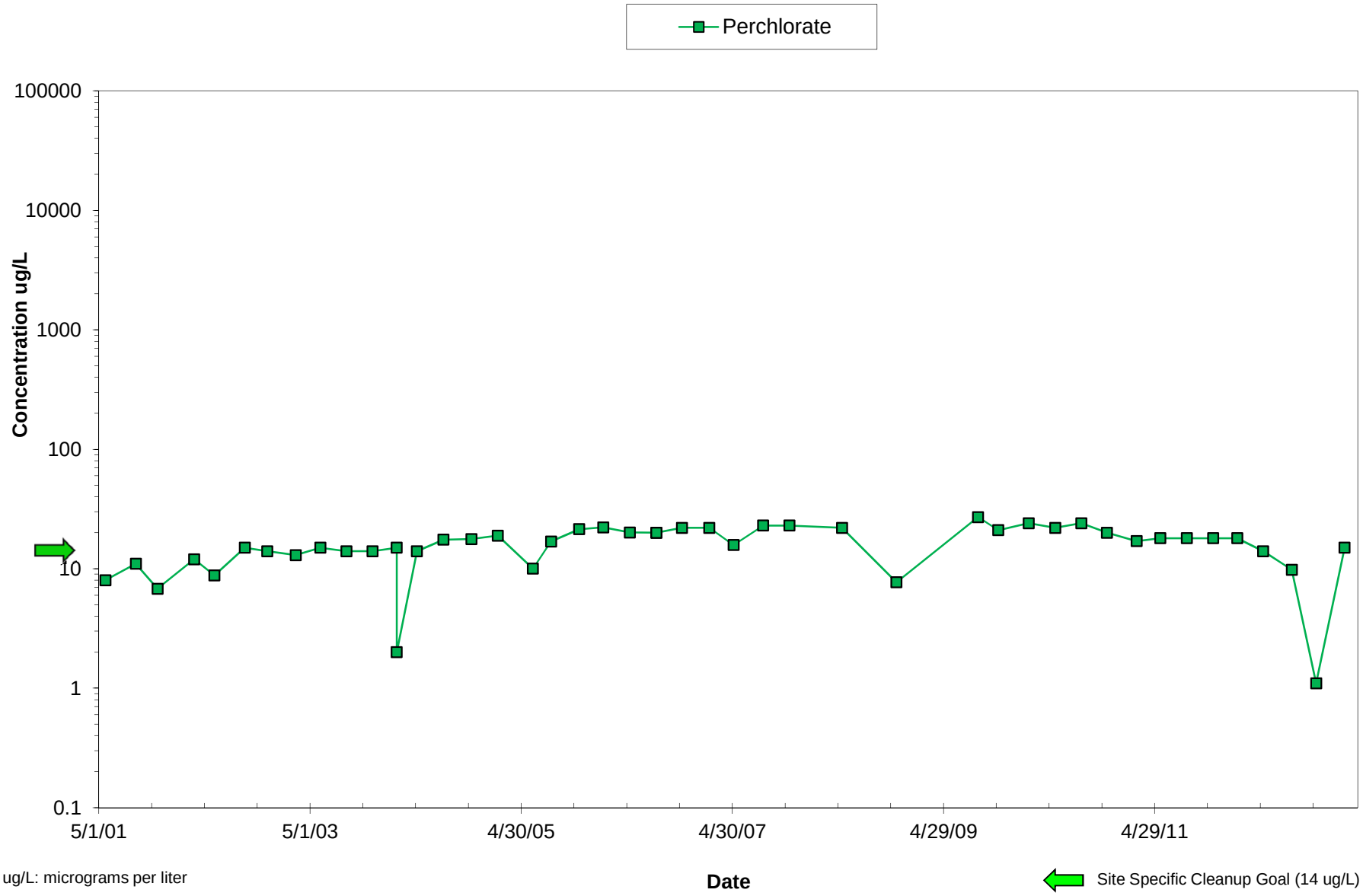
EA-08
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

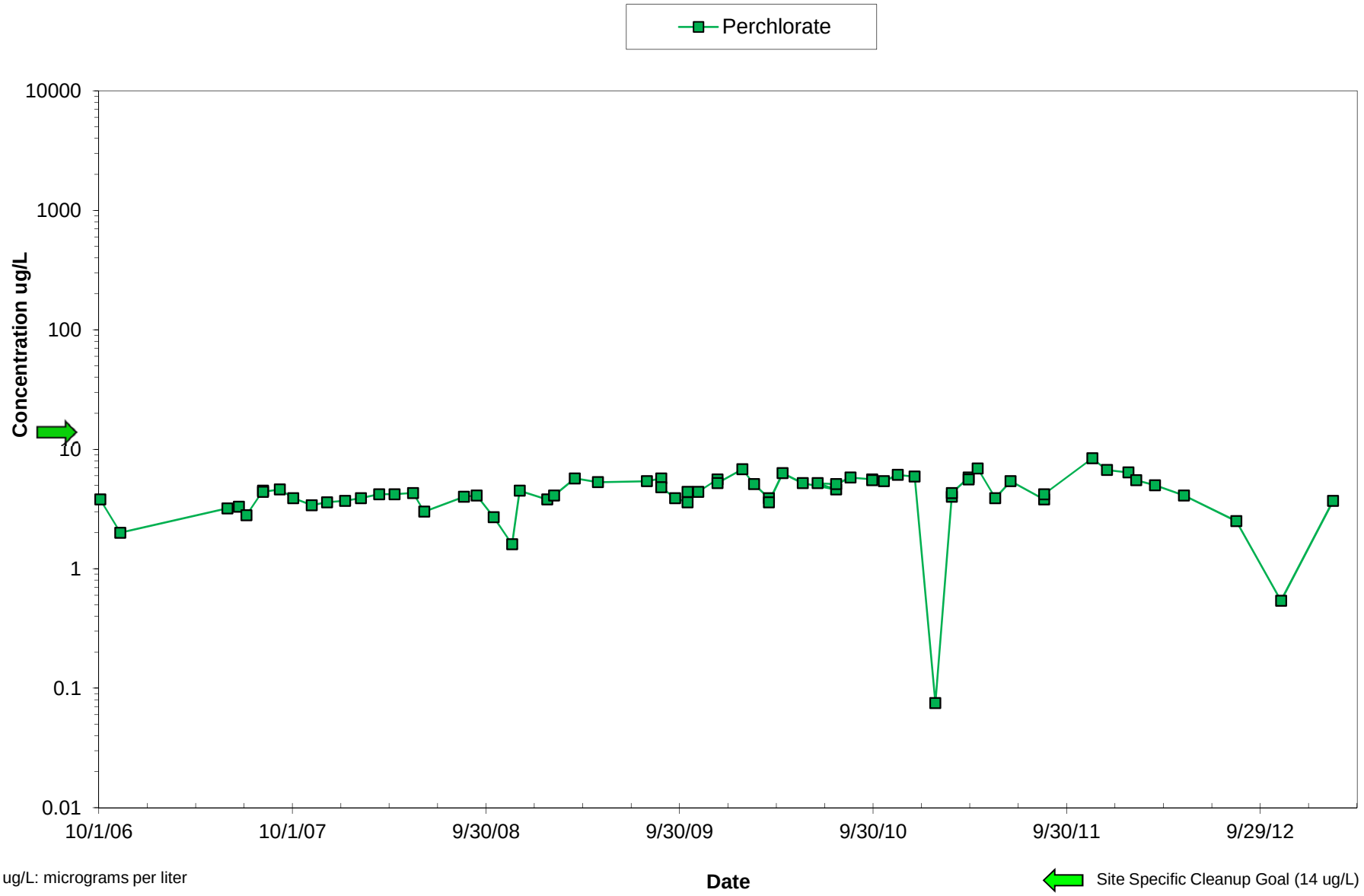
EB-01
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

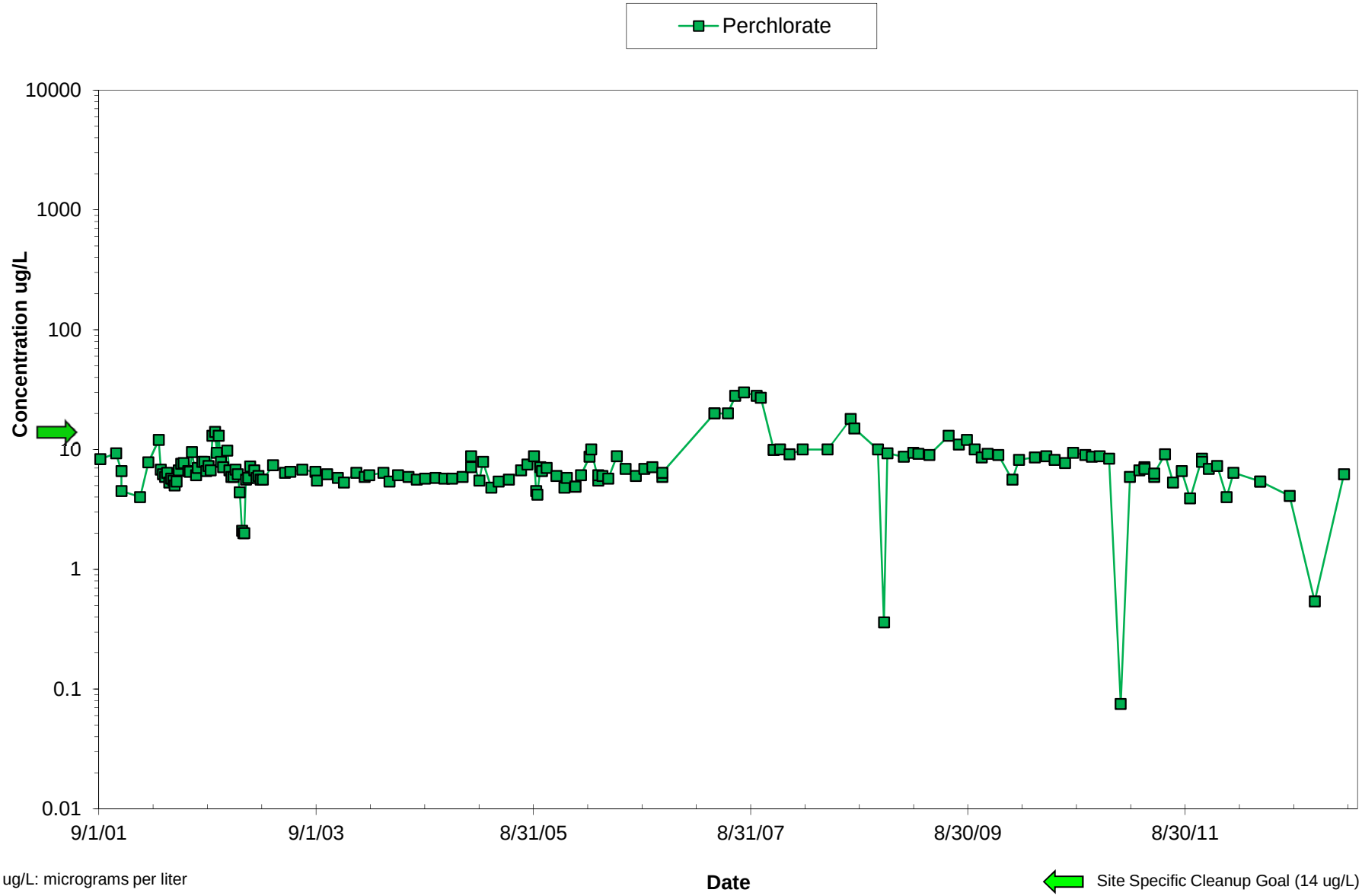
EC-01
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

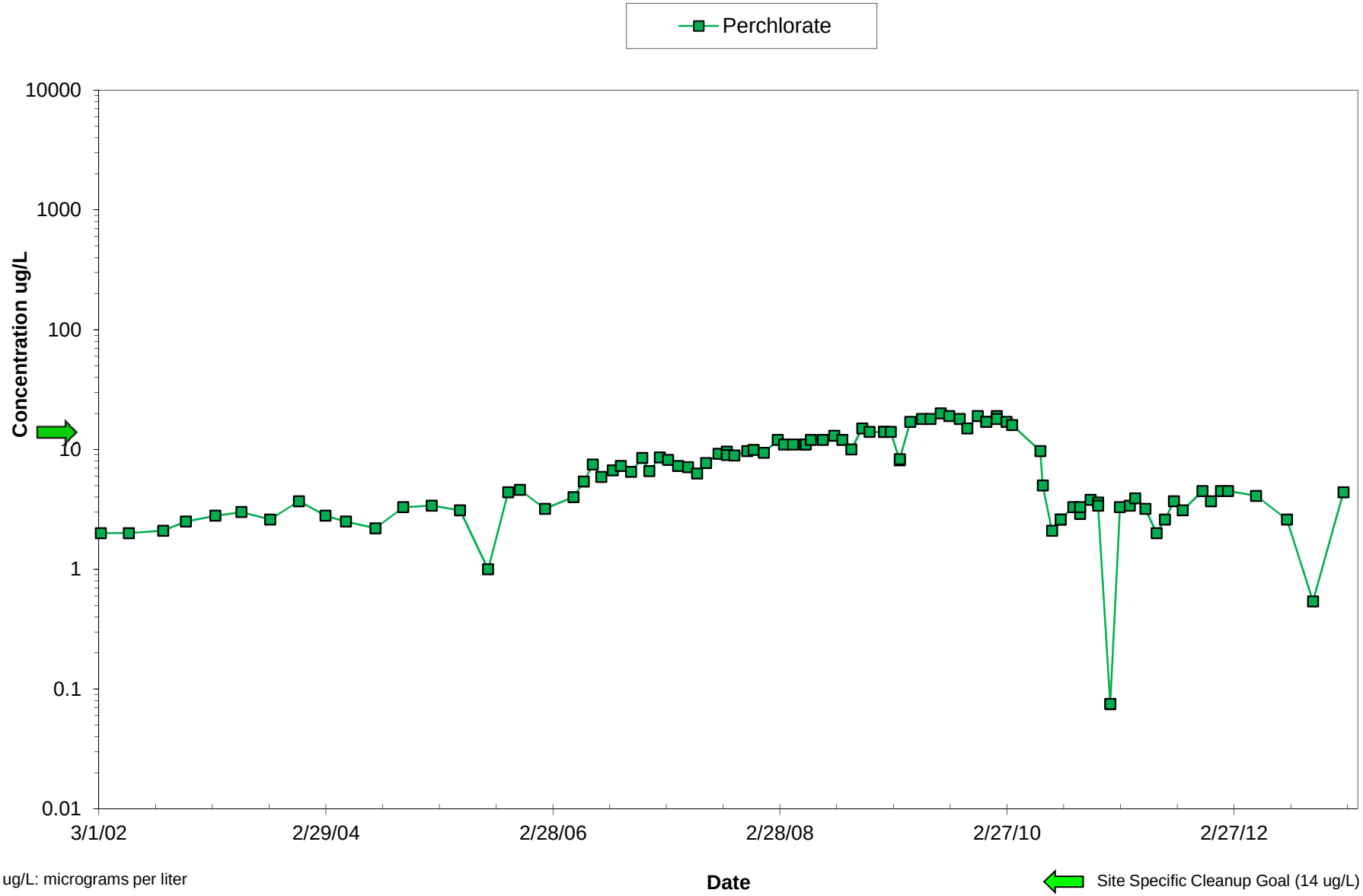
MW-20
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

MATRIXNEWORLD
Enabling Progress

MW-29
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

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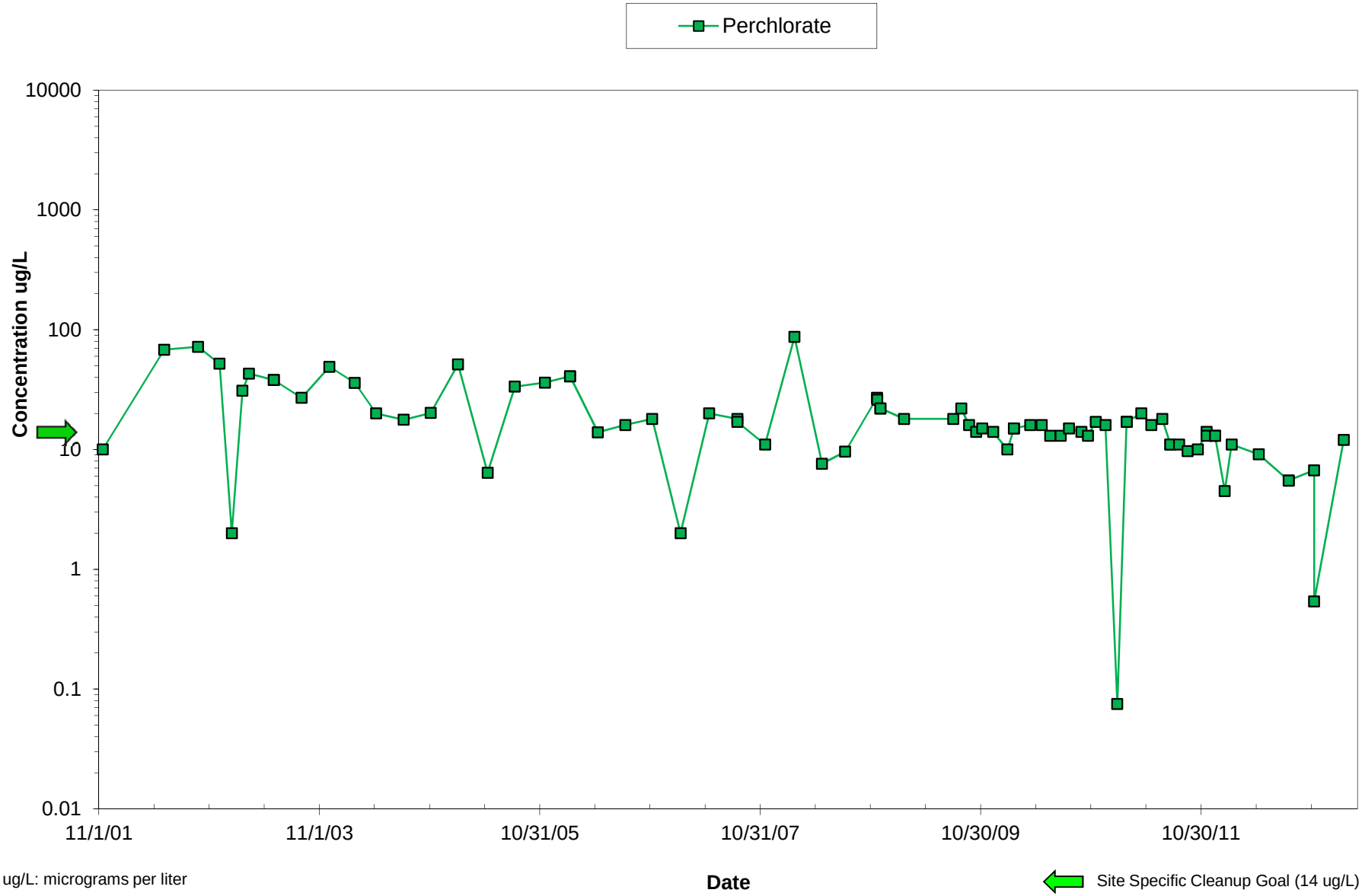
Enabling Progress

PZ-01
Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



ug/L: micrograms per liter

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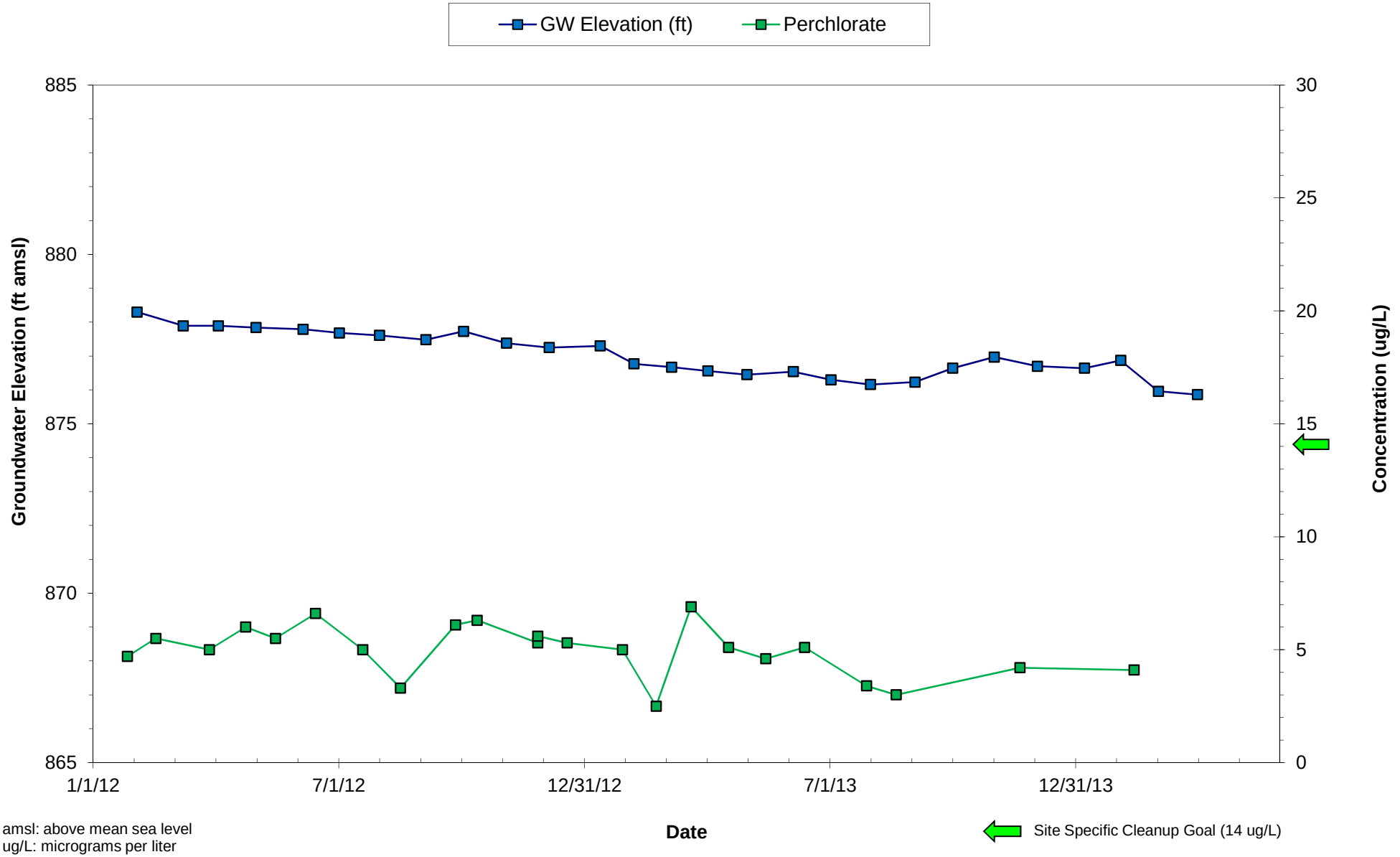
Enabling Progress

EPA MW-21A
Hydrograph and Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



amsl: above mean sea level
ug/L: micrograms per liter

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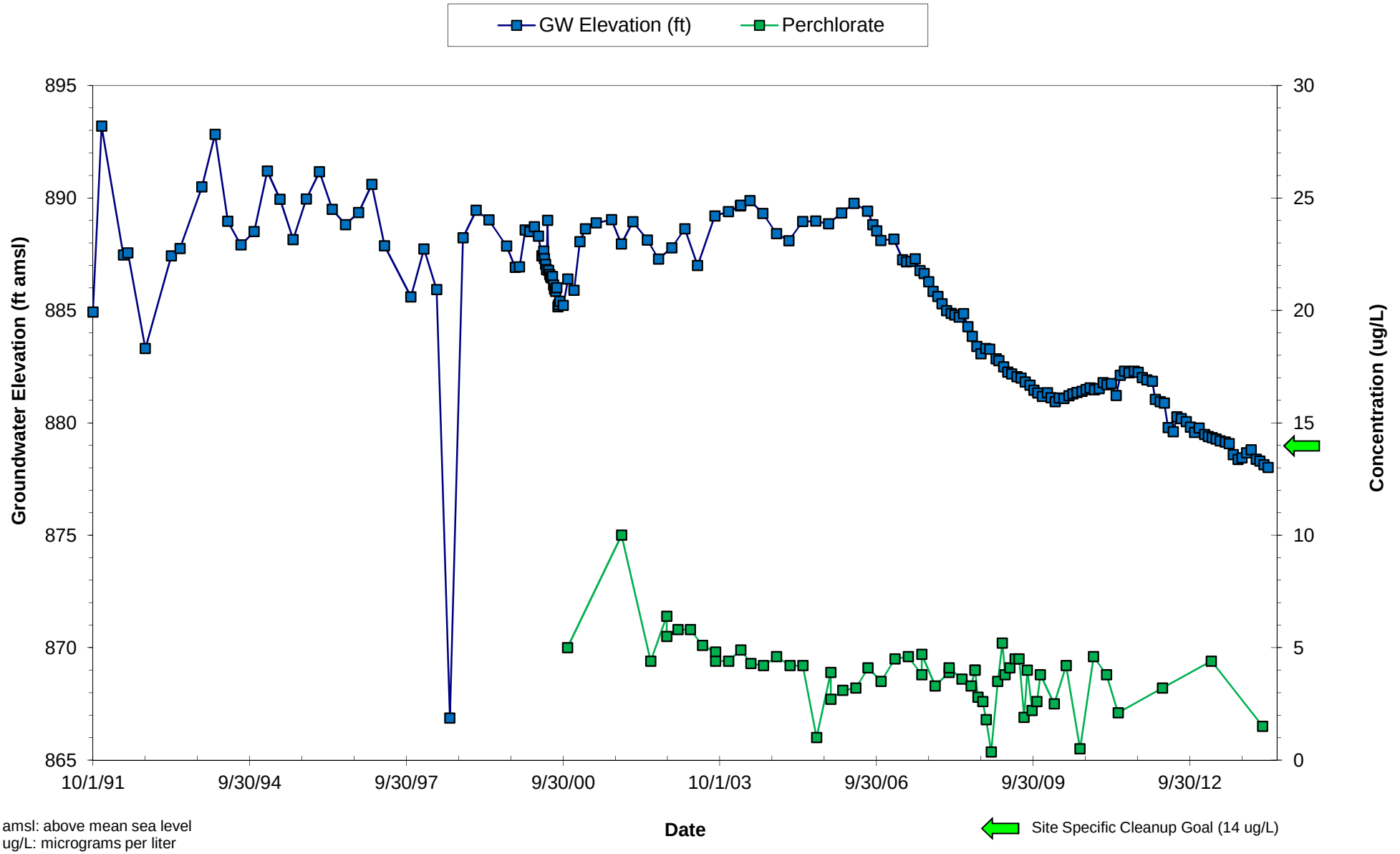
MW-16
Hydrograph and Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



amsl: above mean sea level
ug/L: micrograms per liter

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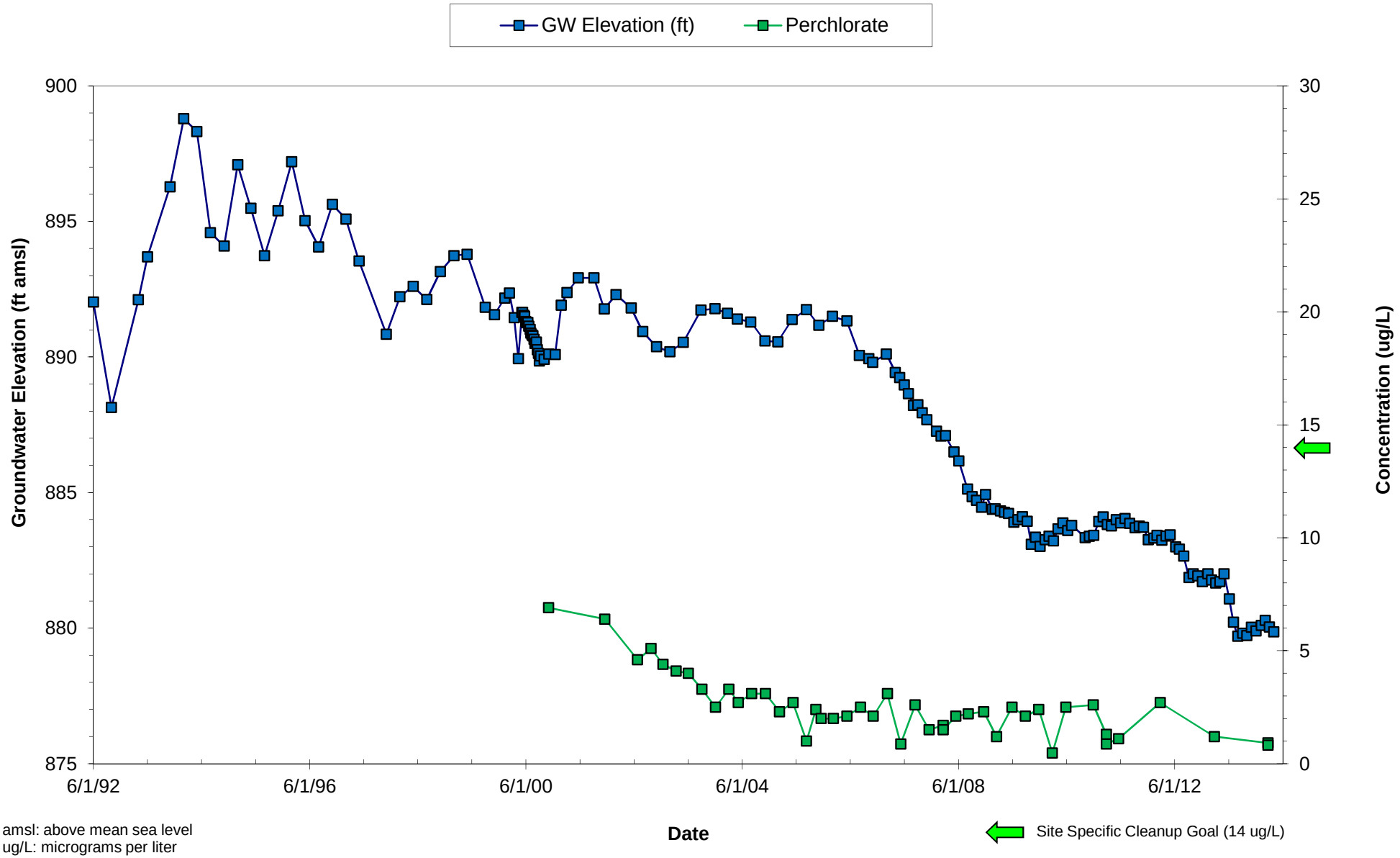
MW-19
Hydrograph and Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



amsl: above mean sea level
ug/L: micrograms per liter

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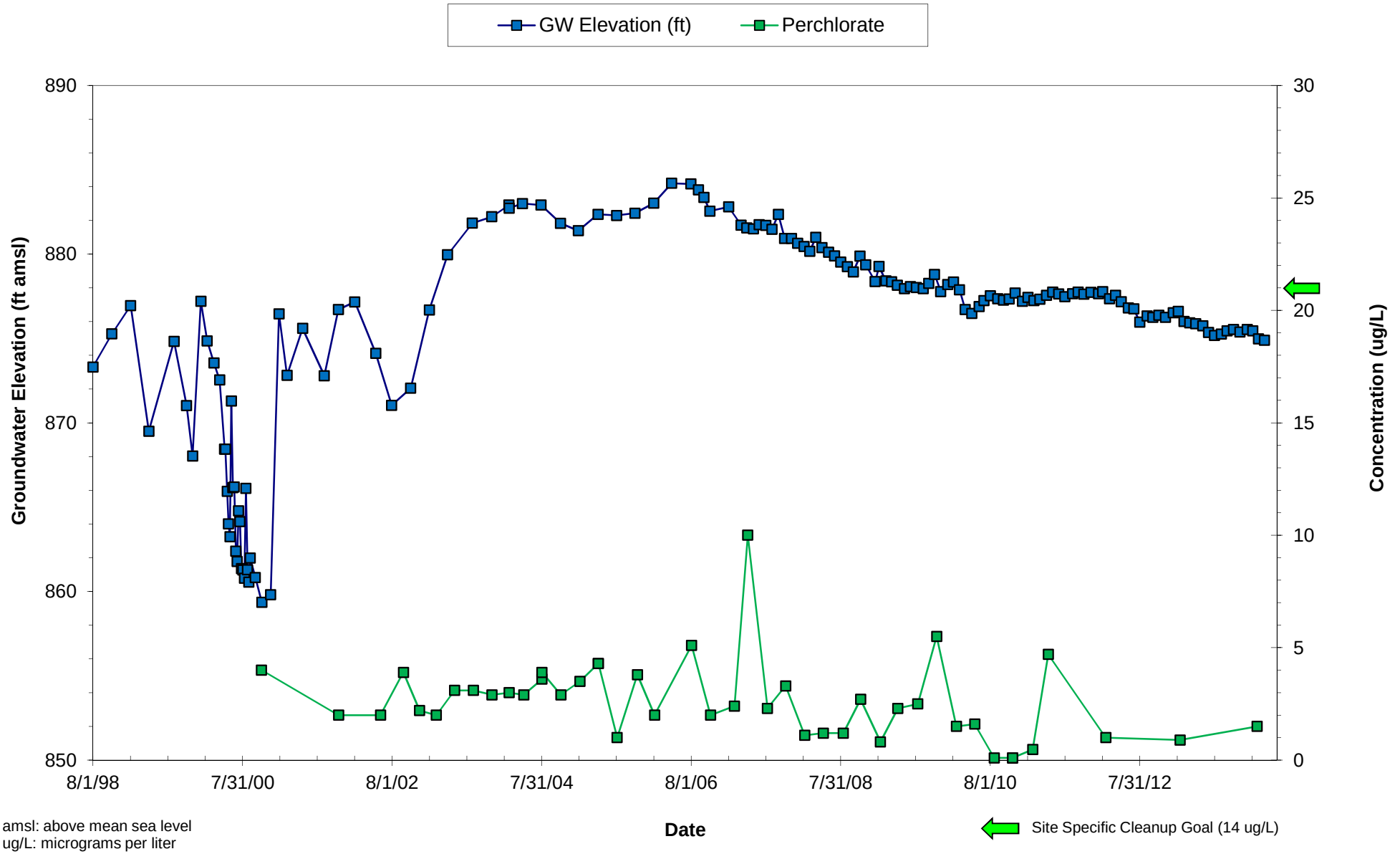
Enabling Progress

MW-24
Hydrograph and Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



amsl: above mean sea level
ug/L: micrograms per liter

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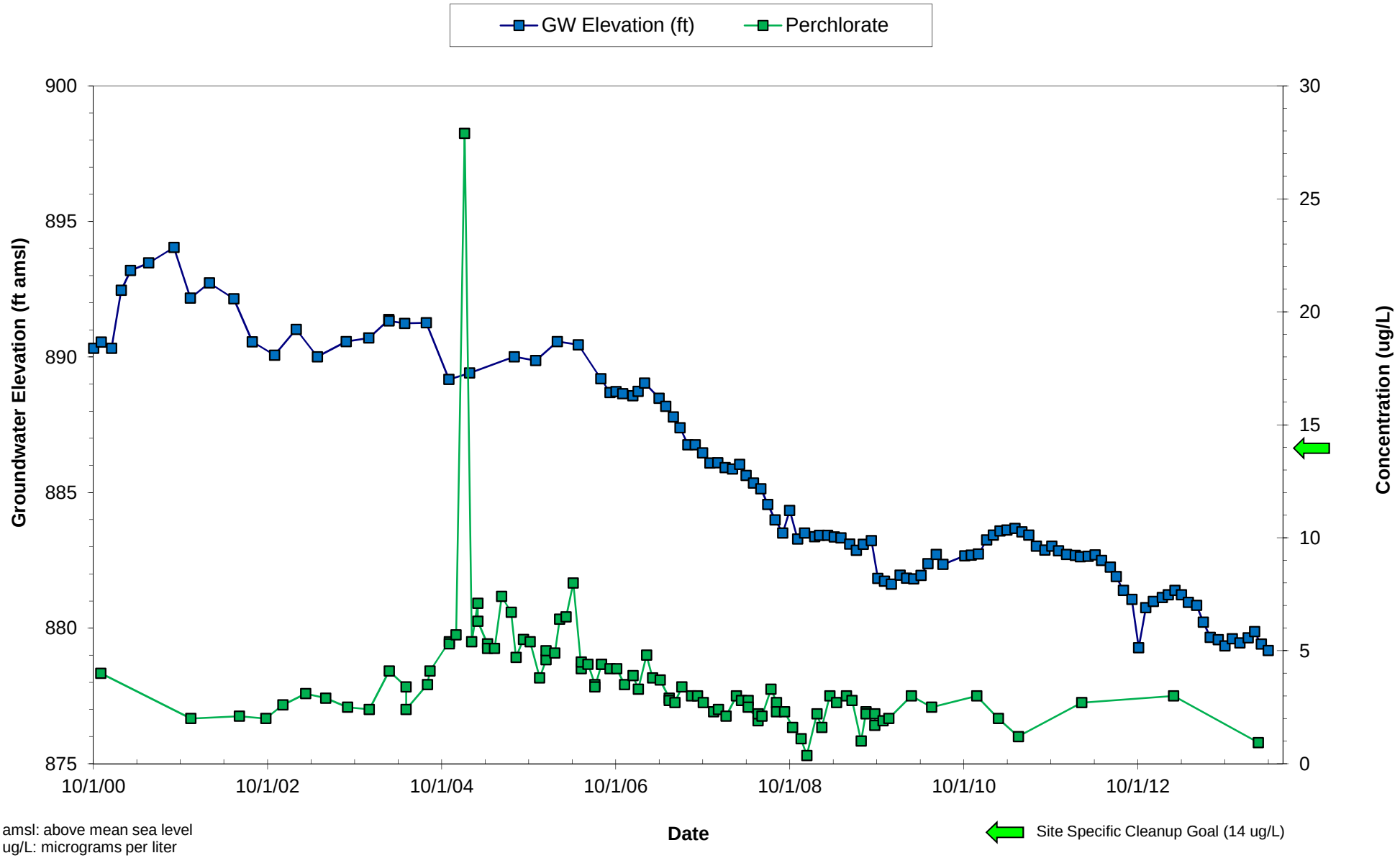
MW-25
Hydrograph and Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



amsl: above mean sea level
ug/L: micrograms per liter

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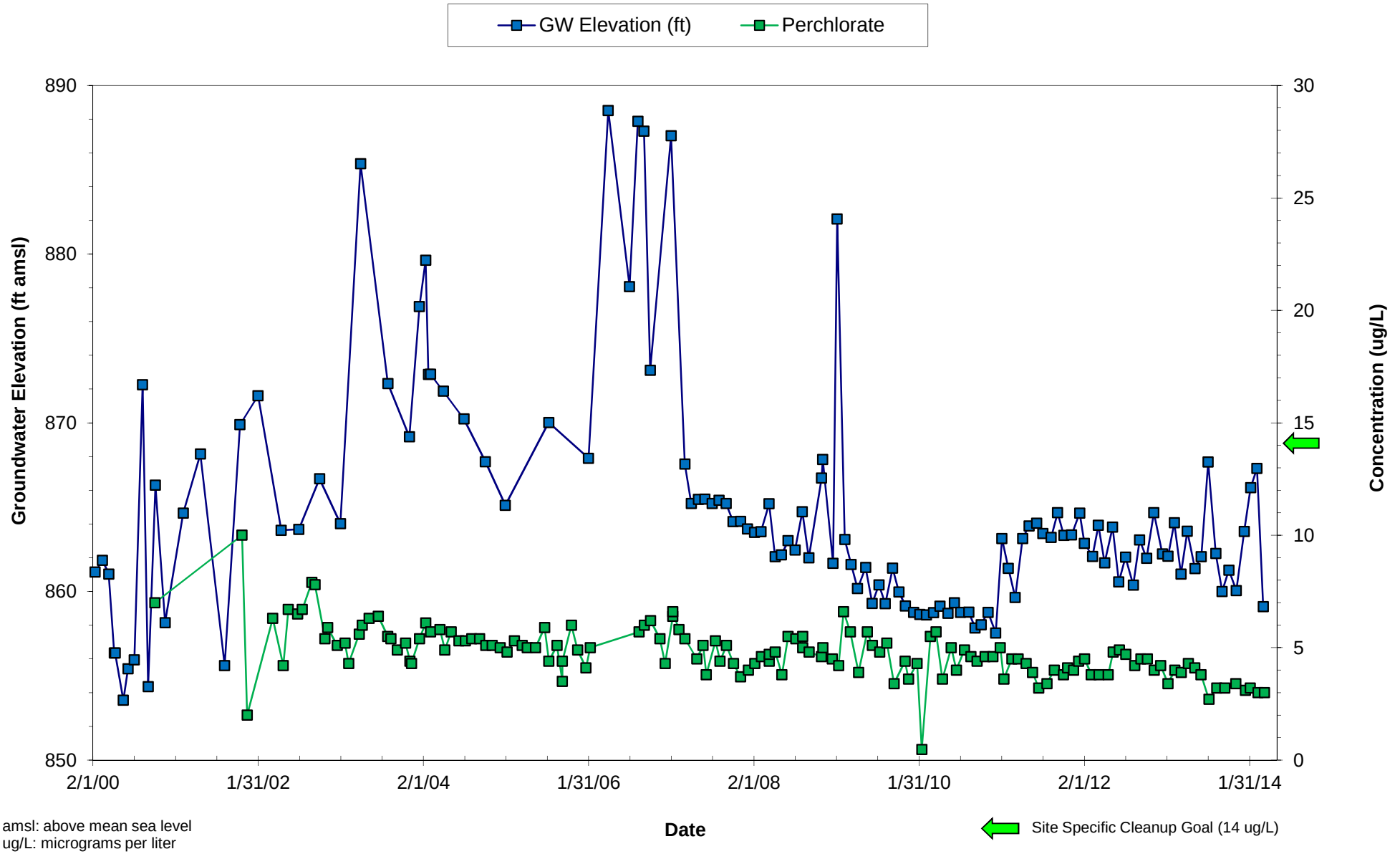
33A
Hydrograph and Perchlorate Concentration Trend Graph
Phoenix-Goodyear Airport-North Superfund Site
Goodyear Arizona



amsl: above mean sea level
ug/L: micrograms per liter