

Clifton-Fine Water System Improvements

**Towns of Fine and Clifton, St. Lawrence County
New York**

Preliminary Engineering Report

August 2013



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Prepared For:

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1.0 Introduction

The Star Lake Water District (PWS ID# NY4404398) serves approximately 930 users through 355 service connections in the Hamlet of Star Lake, New York. The Water District is a special improvement district that is operated by the Town of Fine, which is located wholly within the Adirondack Park, St. Lawrence County, New York. The Town of Fine was established in 1844 and covers an area of approximately 169 square miles. Critical users of the water system include the Clifton-Fine Hospital and the Clifton-Fine Central School. Multiple food service providers and other businesses, including the Clifton-Fine Municipal Golf Course are also provided water through the system.

The system's water source is surface water drawn from Star Lake. The lake water is filtered through diatomaceous earth filters and chemically disinfected prior to distribution. Currently, the Star Lake Water District is struggling with an aging public water system originally established and constructed in 1951. The last extension of distribution piping was added to serve the Clifton-Fine Hospital in 1964. Filtration was added to the system in 1993.

The Star Lake water treatment system is consistently struggling to meet daily water use demands during the summer months. Frequent water main and service connection breaks have resulted in the loss of several hundred thousand gallons of water per incident. For a system that struggles to meet the normal daily demands during the summer months, frequent water main breaks often result in water emergencies within the hamlet which include mandatory water conservation and ordering local fire departments to not use the system's hydrants. These critical situations pose a threat to both the health and the safety of the residents the water system is required to protect.

The Fine Town Board is taking a proactive approach to address these issues, and, on behalf of the Star Lake Water District, retained the Development Authority of the North Country (DANC) to fulfill the role of the Town Engineer for the project. With the help from DANC, the Town further retained Barton & Loguidice, P.C. (B&L) in September 2012 to prepare this Preliminary Engineering Report assessing the District's treatment and distribution infrastructure and to identify potential improvements. During the scoping for the Preliminary Engineering Report, it was identified that investigating water supply needs outside the immediate Star Lake water service area, including the option to interconnect with the neighboring Woodhaven Water System and Newton Falls Water System, should be considered.

Both the Star Lake Water District and the Woodhaven Water System are in the Hamlet of Star Lake, but in two (2) separate towns. The Town of Clifton's Woodhaven Water District (PWS ID# NY4405673) is approximately a half mile east along NYS Route 3. The Woodhaven Water District is a smaller and separate community water system which serves approximately 55 people through 29 connections.

Concurrent with the development of this Preliminary Engineering Report, the Town of Clifton's Newton Falls Water System received notice that it's single largest user, the Newton Falls Paper Mill, was permanently closing. The Newton Falls Water System (PWS ID# NY4404403) is located approximately four (4) miles northeast of the Hamlet of Star Lake in the Hamlet of Newton Falls and Town of Clifton.

It is essential that this project be developed with the regional needs of the communities in mind. Interconnecting adjacent water systems creates a long term benefits and cost savings to the involved districts, provides redundancy and potential additional water source supply options and provides opportunity for water for additional properties in the region. Given the timing of this report and the recent permanent Mill closure, an interconnection to the Newton Falls water system is not included in the project at this time. However, the needs of the Newton Falls water system are discussed in this report and it is intended that additional evaluation of a potential interconnection to the Newton Falls water system will take place in 2013-2014.

2.0 Project Planning Area

2.1 Location

The potential Clifton-Fine Water System Improvement project consists of properties located within both the Town of Fine and the Town of Clifton, within and adjacent to the Hamlet of Star Lake in St. Lawrence County, New York. Should funds allow, an interconnection to the Newton Falls water system would be evaluated which would additionally include NYS Route 3 and County Route 60 between Star Lake and Newton Falls.

2.2 Environmental Resources Present

The Hamlet of Star Lake is predominantly a lakefront community surrounding Star Lake. The 237 acre lake is located on the western foothills of the Adirondack Mountains and provides excellent opportunities for recreational fishing and boating (rafting). The 4.6 miles of shoreline is mostly developed with about 160 residential homes and cottages, the majority of which are year-round (58 of which are seasonal homes). It is noted that the existing Star Lake water service area has 355 service connections, approximately 70 of which are seasonal.

The Hamlet of Newton Falls is a Mill Town created in the early 1900's to support the Newton Falls Paper Mill. The Hamlet is nestled above the Oswegatchie River although very few of the homes in the Hamlet are water-front homes. Today the Hamlet is still intact despite the recent unfortunate permanent closing of the paper mill. The Clifton-Fine area has been devastated by the loss of over 2,000 jobs since the closing of J&L Mines in 1977 and now the permanent closure of the Newton Falls Paper Mill.

Approximately 7,000-feet East of the Woodhaven Water System is the location of the former J&L Mine facility. In 1977 the J&L facility permanently closed and in 1987 it was discovered that this site was contaminated with one of the largest fuel spills in New York State's history. The site is presently listed as a potential State Superfund Site. Efforts are underway to cleanup and market this site for future redevelopment. Given the restrictions on developing potable water at the site due to contamination, access to a municipal water source would be necessary to support future development. Although service to the J&L Mine facility is not included in this project, improvements made to the Clifton-Fine water systems would provide access to municipal water that could be provided through a future district extension to serve this location.

The North Country Regional Economic Development Council has also identified a significant railroad improvement project as a Priority Project and has secured \$10M in grant to construct the improvements. The project would serve to connect the Clifton-Fine area to regional markets and create a more sustainable environment for the Clifton-Fine community.

According to the U.S. Fish and Wildlife Service's (USFWS) list of federally listed endangered and threatened species list, St. Lawrence County has known or likely presences of Bald Eagles and Indiana bats. According to the NYS Office of Parks, Recreation and Historic Preservation (OPRHP), there are no sites on the state/national register within the project area; however, areas around the Hamlet of Newton Falls are shown as "Archeological Sensitive Areas". Adirondack Park Agency wetlands and NWI wetlands are shown on attached Figures 6 and 7, respectively. FEMA flood plain maps are attached in Exhibit 4.

Potential impacts on environmental resources as a result of the project would be adequately assessed throughout the completion of the SEQR/SERP process, including a full coordinated review, as the project develops. Additionally, full consultation with the State Historic Preservation Office (SHPO), USFWS, the Adirondack Park Agency (APA), NYSDEC and OPRHP would be completed.

2.3 Growth Areas and Population Trends

The Town of Fine had a population of 1577 in 2000 and a population of 1512 in 2010 or a 4.1% decrease. The Town of Clifton had a population of 788 in 2000 and a population of 751 in 2010 or a 4.7% decrease. Future water demand projections are discussed later in the report.

3.0 Existing Facilities

3.1 Location Map

The Town of Fine's Star Lake Water system is comprised of a surface water treatment facility/pump house located at 4212 State Highway 3 on the Shore of Star Lake, a 200,000 gallon painted steel ground water storage tank located on Bald Mountain behind 4195 State Highway 3 and approximately 35,000 feet of water main throughout the Hamlet.

The Town of Clifton's Woodhaven Water District is comprised of a groundwater well, a water treatment facility and approximately 1,800 feet of water distribution piping. There is a gap of approximately 0.5 miles between the two (2) distribution systems.

The Town of Clifton's Newton Falls Water District is comprised of a 100 gallon per minute surface water treatment facility located on Overlook Avenue, a 272,00 gallon painted steel ground water storage tank on Summit Avenue and approximately 12,000 feet of water main within and immediately adjacent to the Hamlet.

Existing water facilities, as well as the existing Water Districts, are shown within the attached Figure 1.

3.2 History

Star Lake Water System:

The Star Lake Water District distribution system was originally constructed in 1951 with a permitted withdrawal of 150,000 gallons per day (WSA 2132 and 2132 modified) from the lake. Service area expansions in 1957 (WSA 4227) and 1964 (WSA 4597) primarily make up the service area today. Screened water gravity flows through a 10-inch asbestos cement intake pipe from approximately 300-feet from the Star Lake shoreline into a raw water pit within the approximately 24' x 24' water treatment facility. Water is then pumped from one (1) of two (2) 100 gpm pumps through diatomaceous earth filters and disinfected with sodium hypochlorite as it passes through a 12,000 gallon baffled clear well outside the water treatment facility. Two (2) 200 gpm high lift pumps then pump the treated water into the distribution system and up to the 200,000 gallon, 34 foot diameter, 29'-10" high, steel storage tank. The distribution system consists of approximately 35,000 feet of Asbestos-Cement (AC) pipe serving approximately 355 connections.

Woodhaven Water System:

The Town of Clifton's Woodhaven distribution system was originally constructed in 1945 serving what was the Jones and Laughlin Ore Company (WSA 1664). In 1969, the Town of Clifton created the Woodhaven Water District served by the same water supply facility (WSA 5673). The water supply consists of an 8-inch diameter well, a 40 gallon per minute well pump and a 3,000 gallon hydro pneumatic tank. The well pump and chemical feed pump are located within a dilapidated structure within the service area. There are no alarms at the facility and no backup power and prolonged water outages are common. Although fire protection was provided originally in the water system, it was removed many years ago.

Newton Falls Water System:

The Town of Clifton's Newton Falls water system was originally installed to serve the Newton Falls paper mill and the Newton Falls community. The system received an upgrade in 1997 consisting of new water source wells, a new filtration plant, new water mains and a new water storage tank.

3.3 Condition of Facilities

Star Lake Water System:

Water Treatment Facility: The Town of Fine's system has outgrown its original designed capacity. Inadequate and unreliable treatment capacity is the most significant problem facing the Star Lake Water District. To attempt to meet the peak demands, the filter plant runs continuously during the summer months. Although each treatment unit is rated for 100 gpm, actual operation can require backwashing every three (3) hours, equating to an actual treatment capacity of 126,000 gpd. In review of the operations reports for the facility, the filter plant has a maximum monthly average daily demand of 101,000 gpd. Peak daily demands occur numerous times throughout the summer (particularly on weekends) and exceed the treatment capacity resulting in a loss of storage volume despite continuous operation of the treatment facility. The treatment facility additionally lacks site security, back-up power, automation and alarms and is in need of a significant upgrade to meet current design standards and to provide a reliable source of water to the district. Photos of the Star Lake Water Treatment Facility are included in Exhibit 8.

Water distribution mains: The existing water distribution mains within the Star Lake water distribution system are aged asbestos cement pipe and in need of replacement. Water meters are utilized for most commercial users only. The water main along NYS Route 3 is located beneath the pavement (parallel to NYS Route 3) and has resulted in significant costs to the District when a break occurs. The age and composition of the asbestos cement main limits the Town's ability to adequately flush the system, for fear of line breakage and potential of exposing asbestos fibers in to the water system.

Water Storage Tank: A tank inspection was completed in 2008/2009 by Liquid Engineering Corporation. The test report is attached in Exhibit 6. As noted in the tank inspection report, the interior coating of the tank was observed to have staining, delamination and blistering significantly affecting the coating resulting in over 17% of the entire tank interior observed as rusting. The exterior tank coating was noted to be in good shape with minimal rusting observed. Additionally, the tank site lacks site security and OSHA compliant access to the tank. Photos of the Star Lake Water Storage Tank are included in Exhibit 8.

Woodhaven Water System:

Water Treatment Facility: The Town of Clifton's Woodhaven system configuration is extremely vulnerable to prolonged outages and no longer complies with current design standards (well pump is not 10 times the average daily consumption rate and the hydropneumatic tank is not 10 times the well pump, system lacks redundancy of critical components, and system lacks back-up power and alarms). The system components are primarily original to its inception in 1945. Severe deterioration of pumps, tanks and the treatment building are evident. Photos of the Woodhaven Water Treatment Facility are included in Exhibit 8.

Water Distribution mains: Additionally, the water distribution system has experienced numerous breaks over the years and there is no metering. Water pressures vary considerably and prolonged water outages are common practice due to small diameter, aged galvanized water piping comprising the water distribution system. Water pressure monitoring results at several locations within the Woodhaven Water System are attached in Exhibit 5.

Newton Falls Water System:

The Newton Falls Water System has recently exceeded water quality standards for disinfection byproducts. As a result, the Department of Health issued a Statement of Non-compliance. With the permanent closure of the Newton Falls paper mill, the user demands have significantly decreased which has resulted in the violations. Without the Mill, the water system is significantly oversized which will create future issues such as disinfection byproducts, chlorine residual levels, water storage tank retention time and freezing due to the lack of turnover in the tank. In addition to the violations, the water system will be losing 52 of its 175 units with the permanent closure of the mill. This decrease will result in significant increases to water charges for the remainder of the water system.

3.4 Financial Status of Existing Facilities

Star Lake Water System:

The Star Lake Water System does not have any existing debt. Operation and Maintenance Costs for the district are collected through a water rent and a tax levied on district users based on the assessed value of their real property (ad valorem). Water rent is collected through issuance of water bills to the system's users. The current water rent is as follows:

- \$350 per year for Residential Users
- \$350 per year for Commercial Users for use up to 52,000 gallons
- \$0.60 per 1,000 gallons additional for usage between 52,001 and 66,000 gallons for Commercial Users
- \$0.50 per 1,000 gallons additional for usage over 66,000 gallons for Commercial Users

Since water meters are only present on commercial connections, all residential users are billed the flat rate of \$350 per year.

The 2012 tax rate for the Star Lake Water District was \$1.260247 per \$1,000 of the assessed value for each property in the District. The average assessment value of single-family household properties within the district is \$72,542, therefore the average ad valorem charge for a single-family household equates to \$91.42 per year. The average current total cost of water for users within the District is therefore \$350 + \$91.42 or \$441.42 per year.

The Star Lake Water District has a reserve balance as of December 31, 2012 of \$87,079. The reserve balance would be maintained throughout the project to ensure adequate funds are available should equipment need to be replaced prior to the improvements proposed herein.

Woodhaven Water System:

The Woodhaven Water District has \$10,770.64 of debt owed to the Town of Clifton's general fund. Operation and Maintenance costs are collected via the issuance of annual water bills of \$550 to each user of the District. The Woodhaven Water System currently does not have any reserve account. There are no water meters within the Woodhaven Water District.

4.0 Need for Project

4.1 Health, Sanitation and Security

Star Lake Water System:

The Star Lake Water System has numerous health, sanitation and security concerns that, in part, were the impetus of this study. The Town has adequately operated and maintained the system since its inception; however, many of the system's components are aged and deteriorated and/or do not meet the current demands of the system. These components are further described as follows:

- Inadequate treatment capacity – The current facilities in place cannot meet peak user demands as discussed above. This results in periods of time, sometimes for weeks on end, where the water storage tank continuously loses volume. In 2012, multiple leaks in the distribution system resulted in unfiltered water being introduced into the system to meet demand. This situation occurred again in July 2013 when the treatment facility could not meet the user demands and unfiltered water was pumped into the system to meet demands. These situations highlight the significant health concerns related to the inadequate treatment capacity in the Star Lake water system. Water conservation, emergency and boil water notices are included as supporting information in Exhibit 7.

- Turbidity violations – In August 2012, the Department of Health issued the Star Lake Water District a violation for exceeding turbidity standards during July 2012. This is another example of the aged and inadequate treatment facilities currently in place and vulnerability of the source. The violation letter is included as supporting information in Exhibit 7.
- Lack of back-up power – There is currently no back-up power located at the treatment facility. This again exacerbates the concerns during summer months when the treatment system already cannot meet the user demands.
- Lack of control/automation – The water treatment system lacks control/automation and alarms in order to operate the system efficiently and properly notify operating personnel when issues arise. Additionally, there are no means of communication between the treatment facility and the water storage tank. Without alarms, the system has a significantly higher potential for an issue to evolve into a public health hazard.
- Aged and deteriorated mains – The majority of the Star Lake water system was constructed in 1951. Water mains installed are mostly asbestos cement. The system experiences frequent breaks in the water mains during normal operation, let alone when the system experiences elevated stress during fire or water main flushing events. The asbestos cement water mains are noted to be especially sensitive to flushing activities which have precluded system operators from adequately flushing the water mains due to fear of additional pipe deterioration and exposing asbestos fibers in to the water system.

- Aged and deteriorated tank – The 200,000 steel ground storage tank is a vulnerable system component that is in need of repair or replacement. The tank coating has deteriorated beyond repair and is no longer providing adequate protection of the tank's steel structure. Additionally the site lacks site security and OSHA compliant access to the tank.

Woodhaven Water System:

Much like the Star Lake System, the Woodhaven Water System not only suffers from aged and deteriorating components, but does not possess the reliability or redundancy that a public water system is expected to provide its users. The Woodhaven water system has numerous health, sanitation and security concerns. District residents are faced with frequent water outages due to the condition and susceptibility of the water system. Significant concerns are discussed further below:

- Coliform violations – In 2004 and 2005, the water system was issued a series of coliform violations. The violations have since been corrected; however, the Town has significant concerns regarding the water treatment system's vulnerability to future coliform contamination.
- Lack of redundancy of critical components – The water system is fed by only one (1) well. District residents are frequently without water for extended periods of time due to routine maintenance on these critical system components due to their lack of redundancy.
- Lack of back-up power – There is currently no back-up power located at the treatment facility.

- Vulnerable Treatment System – As noted above, the system is subject to a loss of water to the system for extended periods of time due to routine repairs and maintenance activities. The severely aged and deteriorating Water Treatment Facility has reached the end of its useful life and is in need of replacement.
- Lack of control/automation – The Woodhaven water system lacks the control/automation and alarms necessary to optimize the system efficiency, reduce interruptions in service and adequately notify operating personnel when an issue arises. Without alarms, the system has a significantly higher potential for an issue to evolve into a public health hazard.
- Aged components – Originally constructed in 1945, the system has seen very minimal upgrades. The entire treatment and distribution system has reached the end of its useful life and is in need of replacement.
- Inadequate system pressure – The system does not provide reliable system pressure during normal operation due to frequent repairs and outages as well as an aged and restrictive water distribution system. This is supported by the April 9, 2012 letter to the Town from the NYSDOH expressing concerns regarding the prolonged outages that the system has experienced. The letter is included as supporting information in Exhibit 7. Additionally, water pressure recordings were obtained for four (4) locations within the Woodhaven Water System which demonstrate inadequate normal operating pressures and regularly occurring water outages within the distribution system. Water Pressure Results are additionally included in Exhibit 5.

Newton Falls Water System

With the permanent closure of the Newton Falls Paper Mill, the Newton Falls Water System is significantly oversized which has resulted in water quality issues. In July 2013, the Department of Health issued the Town a Statement of Non-compliance for disinfection byproducts. These water quality issues will continue to plague the Town with the significant reduction in water usage as a result of the Mill's closure.

4.2 System O&M

Star Lake Water System:

The Star Lake Water System had a 2012 budget of \$143,098 and \$141,523 in actual expenditures in 2012. The 2013 operating budget of the district is \$176,490. The increase is primarily due to the additional appropriation made to fund preliminary engineering services.

Woodhaven Water System:

The Woodhaven Water System has a budget of approximately \$16,000 (\$550 x 29 users). Actual expenditures in 2012 were approximately \$28,000 primarily due to the expense of the water main repair.

4.3 Growth

The project area has experienced minor development growth relating to homes being converted from seasonal to year-round, development of vacant property and commercial interest surrounding the water service area. This is negated in the historic town-wide census population data primarily due to a loss in population in the more rural areas of the Town. For the purposes of this report, a project service area growth of 10% is anticipated.

4.4 Unmet Water Supply Need

Commencing in November of 2012, the Towns of Clifton and Fine conducted an interest and needs survey in the areas adjacent to the Star Lake and Woodhaven Water Systems. The results of the interest survey show that there is outstanding water supply need in both Towns. Many people along Lake Road get their water from shore wells along Star Lake. As indicated on several responses and from discussions with homeowners, water samples have consistently shown coliform in the water. Interest survey results are shown in Exhibit 1.

The Towns are continuing their efforts to seek interest survey responses and most accurately define the service expansion area. For the purposes of this report, it is assumed that the parcels fronting NYS Route 3 between Star Lake and the Woodhaven Water Districts, and unserved parcels fronting Lake Road would be included in a potential water system expansion. It is noted that there has been an expressed interest in municipal water on County Route 60 from Route 3 to the Hamlet of Newton Falls as well.

5.0 Alternatives Considered

The primary objective of the potential improvement project is to deliver safe and reliable drinking water, with adequate pressure, in a quantity that meets all demands (including fire protection), at an affordable cost to the Star Lake Water District, Woodhaven Water District and adjacent areas with unmet water supply need. Alternatives were evaluated for the water supply system as well as for water main installation and replacement. These alternatives included:

1. Water Supply Improvements

- Locating a new groundwater source(s)
- Improvements to the existing Star Lake surface water treatment facility
- Improvements to the existing Woodhaven groundwater treatment facility

2. Water Storage Tank Improvements

- Full repair of the existing water storage tank
- Installation of a new water storage tank

3. Water Main Installation/Replacement and Service Area Expansion

- Replacement of existing aged water mains, hydrants, valves and water services to the right-of-way limits (and connection to existing private water services) within the existing service areas. Installation of new water meters throughout the existing service areas;
- Installation of new water mains, hydrants, valves and complete water services to the house (including new water meters) in locations adjacent to the service area where system improvements can be made by looping, deleting dead ends, improving system hydraulics and serving properties in need of safe drinking water.

5.1 Water Supply Improvements

Water supply improvements are necessary to meet the needs of the systems and to bring the systems into compliance with current design standards. Alternatives evaluated for potential water supply improvements include the following and are discussed in more detail below:

- Locating a new groundwater source(s) – “Groundwater Option”;
- Improvements to the existing Star Lake surface water treatment facility – “Surface Water Option”;
- Improvements to the existing Woodhaven groundwater treatment facility.

Locating a groundwater source has many advantages. Groundwater water sources (not under the influence of surface water) can eliminate the need to provide filtration as is required for surface water sources such as the current water supply for the Star Lake water system. Additionally, the water quality from a surface water source can be affected by failing septic systems, seasonal algae blooms, boater activity and contamination from various sources. Star Lake does not have a centralized sewer system and many of the septic systems around the lake are over 100-years old. Additionally, a recent report completed by Paul Smith’s college (<http://www.protectadks.org/wp-content/uploads/2013/04/Star-Lake-2012.pdf>) indicates that the lake contains elevated levels of chlorides, likely due to the proximity to NYS Route 3. While chloride levels are elevated, they are still well below drinking water advisory levels.

Available groundwater sources within and around the project area must be evaluated through a water source investigation study to identify water quality and water quantity from potential areas. Sufficient quality and quantity must be located within an area that is feasible to connect to the water system(s). There are two (2) potential improvement avenues that the project could follow entirely dependent on the results of the water source investigation:

1. "Groundwater Option" - Sufficient quality and quantity groundwater (with the largest well out of service) is identified. Should this happen, the following source improvements would likely be conducted:
 - Construct a new groundwater treatment facility at or near the new groundwater source site;
 - Abandon the existing Star Lake and Woodhaven treatment facilities *(It is noted that the existing Woodhaven well has previously been pumped at 90 to 100 gallons per minute. Results from the water source investigation may warrant further consideration of redevelopment and improvements to the well).*
2. "Surface Water Option" - Insufficient quality or quantity of groundwater is found
 - Star Lake filtration system improvements, keeping 150,000 gpd capacity, and improvements to Woodhaven well source and/or new compensating groundwater source to pump into joint system; or
 - Star Lake filtration system improvements, increasing capacity. Abandon the Woodhaven system.

Groundwater has significant economical, health and risk benefits for a municipal water system and is the preferred water source alternative for the project. For the purposes of this report, it is assumed that the Town will undertake a groundwater investigation study and sufficient quality groundwater will be located with capacity meeting or exceeding the maximum daily demand of the potential joint water system.

With the recent (spring 2013) permanent closure of the Newton Falls Paper Mill, the potential for an interconnection with Newton Falls arises along with the potential additional water demand. The facilities would be constructed to facilitate a future expansion to handle the increased water demand.

5.1.1 *Locating a new Groundwater Source(s) – “Groundwater Option”*

A preliminary evaluation of the surficial geology in the project area indicates that promising layers of Kame deposits and outwash sands and gravels exist. Surficial geology mapping is included as Figure 2. Discussions with local well drillers support the existence of water bearing sand and gravel deposits in some areas at depths exceeding 100 feet. As noted above, a groundwater source investigation effort would be conducted to attempt to locate an alternative water source for the water system(s).

To completely eliminate the need to upgrade the Star Lake water treatment facility, construction of multiple groundwater wells with a total capacity exceeding the future Peak Daily Demands (PDD) of the system with the largest well out of service would be required. For the purposes of this report, it is assumed that a new groundwater source would be located on the jointly-owned Town golf course property in the Hamlet of Star Lake.

A new treatment building would be constructed near the new well site. For the purposes of this report, a pre-packaged groundwater treatment facility containing equipment for disinfection, pump controls and metering is assumed however an on-site constructed building could also be constructed at a similar project cost. The facility would be constructed with premium efficiency equipment and building envelope materials to minimize wasted energy. Water pumps would be powered by variable frequency drives and premium efficient motors as well to minimize energy waste.

The estimated project costs for constructing a new Star Lake groundwater source is \$1,280,000 as shown within the attached Table 3. Estimates of initial Operation & Maintenance costs are shown in Table 9.

5.1.2 *Improvements to the existing Star Lake Surface Water Treatment Facility – “Surface Water Option”*

The existing Star Lake water treatment building is generally in good condition; however, improvements are warranted with respect to building's aesthetics and energy efficiency should the Town be unsuccessful in identifying a feasible groundwater source alternative. Additionally, a new water treatment system is necessary to meet the needs of the community. The limited size of the parcel which the Treatment Facility is currently located is very restrictive to the current arrangement and would make construction and potential expansion very difficult.

Treatment Equipment: Selection of a surface water treatment technology has to take into consideration the size of the existing Star Lake water treatment building, effectiveness of treatment, reliability, initial capital cost and operating costs to determine the best technology for this application. Potential alternatives for treatment equipment to meet the [USEPA's Long Term 2 Enhanced Surface Water Treatment Rule](#) (LT2 ESWTR) are Slow Sand Filtration, Diatomaceous Earth Filtration and Membrane Filtration (via replaceable cartridge filtration or hollow fiber microfiltration). Filtration of surface water, or ground water influenced by surface water, is required to remove disease-causing microorganisms and contaminants such as giardia and cryptosporidium which are often present in surface water. Slow sand filtration is easily dismissed as it would require a significant building upgrade to house the sand filtration beds and equipment and the initial capital costs would be high. Diatomaceous earth, cartridge filtration and membrane filtration are discussed in more detail below:

Diatomaceous Earth Filtration: Diatomaceous earth, or DE, filtration is currently in use at the Star Lake water treatment facility. Vacuum pumps draw water through a filter unit containing ten (10) septums that have been “caked” with a layer of diatomaceous earth. Treatment and operation is relatively simple however in addition to the filter units, a DE treatment system also requires a DE mixing system and a backwash holding tank, further increasing the capital cost to implement such a system in the Star Lake water treatment facility. The current operation of the DE treatment system in Star Lake allows for as little as three (3) hours between backwashing in the summer months and up to 30 hours in the winter between backwashing. Due to the frequency of backwashing required in summer months, operation of the system is proven to be incredibly maintenance intensive. Bag filter installation prior to the current DE Filtration System may extend filter runs; however, it would not provide the increase in capacity needed to meet the user demands.

Cartridge Filtration: Advancements in cartridge filtration resulted in the availability of NYSDOH and EPA accepted cartridge filtration units that are capable of meeting design standards with a train of individual filter housings containing replaceable filters. Replaceable filters are available in both cartridge and bag types. Cartridge membrane filtration units can provide more area of filtration which in turn requires fewer units and takes up less space. Cartridge filtration consists of a final filter that meets the LT2 ESWTR requirements preceded by a combination of 10 micron, 5 micron or and/or 1 micron filters to extend the life of the final filter. Filter units are housed within pressurized vessels that are arranged in parallel to provide treatment trains and redundancy.

Membrane Filtration: Membrane filtration can be provided by fixed filtration units consisting of hollow fiber microfiltration capsules. The capsules are periodically backwashed to slough off any attached filtrate. Membrane filtration units are very costly and additionally require mechanisms for backwashing including a backwash holding tank.

Manufacturer's data for cartridge and membrane filtration are included in Exhibit 3. Considering initial capital costs to implement into the Star Lake water treatment building and operational costs (filter replacements), cartridge filtration provides the most cost effective solution. Additionally, cartridge filtration is a simple and reliable method of filtration that is not operator intensive and does not require backwashing facilities. The initial proposed cartridge filtration system consists of three (3) trains of 10 micron, 5 micron and LT2 ESWTR compliant final filters, with each train having a capacity of 100 gallons per minute (gpm) for a total treatment capacity of 200 gpm with one unit out of service. A pilot test would be required to demonstrate the performance of the filtration units and filter fouling rate prior to their inclusion into the project. It is noted that a safe yield analysis would need to be completed to increase the permitted withdrawal rate from Star Lake above the currently permitted 150 gallons per minute.

Additional treatment proposed at the Star Lake water treatment facility includes new chemical injection and monitoring equipment for disinfection and to provide the necessary chlorine residual levels in the system.

Treatment Building Improvements: In order to provide a reliable, energy efficient treatment building that will service the Town(s) for many years to come; several building improvements would be completed. Building improvements would generally include new windows, roof, doors, lighting, ventilation and heating equipment. Mechanical equipment would be replaced with more modern energy efficient equipment with premium efficiency motors. The existing roof would be removed and replaced with a roof that would provide a higher interior ceiling height to allow better access to new treatment equipment. Insulation would be improved to minimize heat loss and the energy efficiency of the structure. While the existing concrete structure and walls appear sufficient to support a new roof structure, their structural integrity would need to be fully evaluated. Walls would be improved/replaced as necessary. The existing interior surfaces would be re-painted and sealed to protect them and extend the life of the structure.

Site Improvements: Site improvements to incorporate a new cartridge filtration treatment system include removal of the existing finished water clear well and backwash holding tank. A new intake would be constructed and the existing intake would be rehabilitated to serve as a future back-up. The new intake would be fitted with provisions for chemical treatment, if necessary. Provisions to draw water from different depths would be evaluated to potentially reduce filtration demands. With the elimination of the clear well, chlorine contact piping would be required to provide the minimum chlorine contact time before the first service connection.

To maintain service during construction, a temporary treatment unit would have to be rented. The Town will continue to seek an alternative surface water treatment facility site given the estimated expense of the treatment unit rental to facilitate a new or upgraded surface water treatment facility on the current site.

The existing Star Lake water treatment site plan and proposed site plan for evaluated improvements to the Star Lake water treatment plant site are attached as Figures 3 and 4, respectively. The estimated project costs for improvements to the existing Star Lake surface water source is \$1,758,000 as shown within the attached Table 1. Estimates of initial Operation & Maintenance costs are shown in Table 9.

5.1.3 Improvements to the existing Woodhaven Groundwater Treatment Facility

The existing Woodhaven Treatment Facility is aged and does not provide a reliable source of water to meet the needs of the community. The building is not suitable for re-use and therefore construction of a new facility would be necessary. Additional improvements would also be necessary in order to bring the facility into compliance with current design standards.

A new treatment building would be constructed to meet the needs of the community. For the purposes of this report, a pre-packaged groundwater treatment facility containing equipment for disinfection, pump controls and metering is assumed; however, an on-site constructed building could also be constructed at a similar project cost. The facility would be constructed with premium efficiency equipment and building envelope materials to minimize wasted energy. Water pumps would be powered by variable frequency drives and premium efficient motors as well to minimize energy waste. The pre-packaged treatment building would be constructed, assembled and tested off-site in a factory, delivered to the site and placed on a prepared slab or foundation. The existing well would be rehabilitated, redeveloped and tested to also bring it into compliance with current design standards and provide a reliable means of water supply. The well is currently pumped at 40 gallons per minute; however, historical documents indicate that the well may have a capacity of 100 gallons per minute or more. It is additionally reported that after a sustained pumping period of several days, the water contained elevated chloride levels. This is likely due to the wells proximity to NYS Route 3. Well capacity (without impacting the water quality), well construction and condition would need to be assessed prior to identifying if the well is feasible for re-use.

The estimated project costs for constructing a new Woodhaven groundwater source is \$664,000 as shown within the attached Table 2. Estimates of initial Operation & Maintenance costs are shown in Table 9.

It is noted that the costs presented above assume that the improvements would be conducted in conjunction with connecting the system to the Star Lake Water System in which the Star Lake water storage tank would provide the pressure and volume needed to provide fire protection within Woodhaven. Alternatively to provide fire protection to the Woodhaven water system without a connection to Star Lake's water system, an isolated fire protection system containing a 120,000 gallon ground fire storage tank and two (2) 500 gallon per minute fire pumps would be included within the new Treatment Building. The fire storage tank, fire pumps and additional space required within the Woodhaven treatment facility would add an additional estimated \$525,000 to the cost presented above for construction of a new Woodhaven groundwater source as shown in Table 2

5.2 Water Storage Tank Improvements

The Star Lake Water Storage Tank was originally installed in 1951. Although the tank has received coating replacement/repairs over its life, the interior coating system has reached the end of its useful life and a full blast and recoat is needed. With the exterior of the tank noted to be in fair condition, only a spot repair and over coating is necessary. Alternatives considered include full repair and recoating of the existing 200,000 welded steel ground storage tank and installation of a new 250,000 gallon glass-fused-to-steel ground storage tank.

Repair of existing water storage tank: This alternative would result in a full blast removal of the existing interior coating system, repair of any areas with excessive corrosion and installation of a new interior tank coating system. The exterior coating would be pressure washed to remove any loose paint, spot repair with hand tool cleaning, and an over coat. Improvements would additionally include installation of a new access ladder to provide OSHA compliant access to the tank, a new overflow and tank vent, installation of a fence to protect the tank and installation of a tank level pressure transmitter and associated power and communications equipment. It is noted that spot repairs of the tank coating system would likely be needed 10 to 15 years after re-coating and the coating would likely need to be replaced again in 20 to 25 years.

Install new glass-fused-to-steel water storage tank: As an alternative to a conventional welded or riveted steel tank which requires field coating, a glass-fused-to-steel water storage tank may be used. Steel panels receive a glass coating which is then “baked” on to the steel creating a physical bond between the steel panel and the glass coating. The panels are then shipped to the site and bolted together to create the tank. Glass-fused-to-steel water storage tanks offer excellent durability and longevity and, with proper care, can last 50 years+ without any significant repairs.

The estimated project costs for repairing the existing storage tank and constructing a new storage tank are \$404,000 and \$775,000, respectively, as shown within the attached Tables 4 and 5.

The 50 year (2015 – 2065) estimated Present Value¹ (2015 dollars) of the evaluated water storage tank alternatives is as follows:

Repair of Existing Water Storage Tank		Install New Glass-Fused-to-Steel Water Storage Tank	
2015 Improvements	\$404,000	2015 Initial Installation	\$775,000
2030 Spot Repair	\$25,000	2040 Repairs	\$20,000
2035 Spot Repair	\$40,000	2060 Repairs	<u>\$40,000</u>
2040 Full Re-coat	\$600,000		
2055 Spot Repair	\$25,000		
2060 Spot Repair	\$40,000		
Total	\$1,134,000		\$835,000

5.3 Water Main Installation/Replacement and Service Area Expansion

As discussed above, several areas within the existing Star Lake and Woodhaven service areas contain water main that is in need of replacement. Additionally, all of the valves and hydrants within the Star Lake water system, and all of the water services within Woodhaven water district are in need of replacement. Newly installed water main serving expansion areas would include hydrants, valves and water services. Water meters would be installed throughout the entire project service area, including all existing and new users of the system.

Common options for new water main are high density polyethylene (HDPE) water main, polyvinyl chloride (PVC) water main and cement lined ductile iron water main. A comparison of these alternatives is discussed in more detail below:

¹Present Value analysis assumes that the time value of money would equal inflation.

Ductile Iron: Cement lined ductile iron pipe was derived from cast iron pipe over 30 years ago. The malleable iron is centrifugally cast, lined inside and out with a spray applied cement lining and then coated with an asphaltic coating. Ductile iron has been the most commonly installed pipe in New York over the past 20 years. With its rigidity and durability, it is very tolerant to installation stresses, “detectable”, tolerant of stresses from poor to moderate native soils and with its cement lining and asphaltic coating it is resilient to corrosive or conductive soils. The ductile iron pipe is often wrapped with a plastic liner to further reduce the possibility of galvanic/corrosive soil corrosion.

PVC: PVC water main is the least expensive material evaluated. However, PVC water main can be very brittle and requires careful attention during installation. For this reason, PVC water main is most often lined with non-native backfill. Additionally, PVC is a non-metallic pipe. A non-metallic pipe requires tracer wire and tracing stations. PVC can be direct tapped; however, a ‘snagged’ service while excavating will likely result in PVC main failure. Many operators and water systems refuse to install any non-metallic pipe for this reason along with the lack of “forgiveness” of PVC piping when excavating in the vicinity of it.

HDPE: High density polyethylene pipe (HDPE) generally provides a robust installation with butt-fusion technology; however, this application is most commonly applied to trenchless installation methods (e.g., directional boring) which are generally more costly. Installation in a populated area is even more difficult due to paralleling and crossing utilities. HDPE will also require tracer wire, tracing stations, and service saddle taps. For these reasons, HDPE is recommended for any directional drilled applications (e.g., road crossings, stream crossings, tree protection bores) where trenchless installation is desired; however, HDPE is not recommended for open-cut trench installation of the remainder of the water main for the proposed facilities.

The extent of water main replacements would depend on the source improvements. Under the groundwater option, source improvements and annual operation and maintenance costs are lower compared to the surface water option. As a result, additional water main would be replaced under the groundwater option. The proposed “Groundwater Option” water distribution system improvements and “Surface Water Option” water distribution system improvements are shown in the attached Figures 5a and 5b respectively. The estimated project costs for the proposed groundwater and surface water distribution system improvements are \$5,126,000 and \$2,739,000, respectively as shown within the attached Tables 6a and 6b. Hydraulic modeling of the existing and proposed water distribution systems is included in Exhibit 5.

6.0 Selection of Alternatives

Water Supply Improvements: The following is a summary of the estimated project costs and estimated initial annual operation and maintenance costs for the evaluated water supply improvements alternatives:

Constructing a new groundwater source(s) – “Groundwater Option”:

Estimated Project Cost - \$1,280,000

Estimated Initial Annual Operation & Maintenance Costs - \$97,500

Improvements to the existing Star Lake surface water treatment facility – “Surface Water Option”:

Estimated Project Cost - \$1,758,000

Estimated Initial Annual Operation & Maintenance Costs - \$167,500

Improvements to the existing Woodhaven groundwater treatment facility (*would not meet the entire system need*):

Estimated Project Cost - \$664,000

Stand Alone Fire Protection adder - \$525,000

Estimated Initial Annual Operation & Maintenance Costs - \$30,000

As shown in the alternative analysis, a new groundwater supply is the most cost effective solution to meet the water supply need for the project area. Additionally, water sources requiring filtration are subject to changing regulations and levels of treatment that could potentially lead to additional capital costs in the future. A new groundwater supply is however predicated on the ability to locate an adequately yielding source of good quality water within or near the project area. Several areas adjacent to or within the project area are of initial interest and should be further evaluated for their potential to provide adequate water supply for the project.

Water Storage Tank Improvements: The following is a summary of the estimated project costs for the evaluated water storage tank improvements alternatives:

Repair of existing water storage tank

Estimated Project Cost - \$404,000

50-year Present Value - \$1,134,000

Install new glass-fused-to-steel water storage tank

Estimated Project Cost - \$775,000

50-year Present Value - \$835,000

Although repairing the existing water storage tank has the lowest initial project cost, consideration must be given to the ongoing maintenance of the steel tank. Tank coatings generally have a life of 20 to 25 years with proper maintenance. As a result of the ongoing coating and maintenance requirements of a painted steel tank, installation of a new 250,000 gallon glass-fused-to-steel water storage tank is the most economical tank improvements option over the life cycle of the tank. The new water storage tank would also serve the Woodhaven water system once the systems are interconnected, precluding the need to install a separate fire protection system in Woodhaven.

Water Main Installation/Replacement and Service Area Expansion: The water distribution system improvements and service area expansion serve to address current deficiencies and meet the needs of the community. Alternative water main materials were evaluated however as shown above, each of these piping options has its advantages and disadvantages. The alternatives for conventional installation of water main are PVC and ductile iron. To obtain the most accurate cost comparison, it is recommended to bid out the improvements with both systems (Ductile Iron and PVC as Base Bid and Alternate Bid). The basis of selection would then be determined by comparing advantages, disadvantages and the actual installation cost of each alternative.

The Water Supply Improvements will determine the extent of water main replacements that would be completed to keep the project affordable. Since the Groundwater Option would result in lower capital and operational and maintenance costs, additional water main would be constructed. The proposed “Groundwater Option” water distribution system improvements are shown in the attached Figure 5a and the proposed “Surface Water Option” water distribution system improvements are shown in the attached Figure 5b.

“Surface Water Option” Water Distribution System Improvements and Service Area Expansion

Estimated Project Cost (Town of Fine) - \$1,835,000

Estimated Project Cost (Town of Clifton) - \$904,000

“Groundwater Option” Water Distribution System Improvements and Service Area Expansion

Estimated Project Cost (Town of Fine) - \$4,222,000

Estimated Project Cost (Town of Clifton) - \$904,000

An interconnection with the Newton Falls water system is not included in the estimated project cost at this time; however, should additional funds be received to make the interconnection economically feasible, the interconnection would be constructed as a part of the project.

7.0 Proposed Project

The proposed project will combine the Star Lake Water System with that of the Woodhaven Water System to ensure that all existing users are provided with an adequate quantity and quality source(s), as well as reliable system infrastructure. The proposed project will also include expansion of water service to serve areas with unmet water supply need.

The proposed project consists of construction of a new groundwater source and treatment facility ("Groundwater Option") however if adequate quantity and quality groundwater cannot be located, improvements to the existing Star Lake surface water treatment facility ("Surface Water Option") would be constructed. Additionally, the proposed project consists of installation of a new 250,000 gallon glass lined water storage tank.

New water main would be constructed to serve areas within unmet water supply need. Additionally, several water mains throughout Star Lake as well as all of the water mains within the Woodhaven water system are reported to be in poor condition and in need of replacement. Improvements for areas proposed for new water distribution facilities would include installation of new 8-inch water main, hydrants at approximate 600-foot intervals and dead ends and isolation valves at every other hydrant and at each water main branch connection. Areas within the Star Lake service area receiving new water main would also receive new water service laterals to the right-of-way and connection to the existing private water service laterals. Areas within the Woodhaven service area and all new service areas would receive entirely new water services from the main to each residence/business. The project would also include installation of new water meters within each residence in the Star Lake and Woodhaven Water Systems and replacement of all valves and hydrants within the existing Star Lake water system. The initially proposed water main replacements and extensions are shown on the attached Figure 5. It is the Town's intention to utilize the funding to the greatest extent possible to replace as much water main as possible. Should additional funds be available through additional grant/loan packages or as a result of construction bids, it is the Town's intent to replace additional water mains, hydrants, valves and water services within the existing Star Lake water system to the greatest extent practical.

7.1 Total Project Cost Estimate

The total estimated project cost for the Groundwater Option is \$7,192,000 inclusive of construction, contingencies, engineering, legal, administrative costs and refinancing debt currently owed to the Town of Clifton general fund by the Woodhaven Water District. A summary of these estimated costs is included as Table 8. Debt service payments would be shared among all EDUs within the water district.

7.2 Service Area Municipal Water Demand

The proposed improvements would serve approximately 1300 people through 400 connections in the area surrounding Star Lake. All property owners who connect to the water supply system would be required under County Health Code to disconnect their private well supply (if applicable) from their plumbing system prior to connecting to the public water system. Equivalent dwelling units (EDU) within the existing and proposed water systems were estimated based on property class codes, water usage records where available, and property usage. Non-agricultural vacant parcels are assessed 0.5 EDU. The preliminary EDU assessment is included as Exhibit 2. User demands are shown below based on proposed project service area(s). Average demands are based on 200 gallons per day (gpd) per EDU. A peaking factor of 2 was used to calculate peak daily demands. Future flows were estimated based on an additional 10% water demand to account for attrition and expansion within the service area. It is noted that the Newton Falls Water District is not included in the project at this time however the facilities proposed for the water system improvements would be expandable to accommodate the additional water demand.

Table 7.2 – Estimated Water Demands (gpd)						
	Debt Service EDU's	O&M EDU's	Avg. Daily Demand (ADD)	Peak Daily Demand (PDD)	Future ADD	Future PDD
Existing Star Lake Water District	466.9	398.2	79,640	159,280	87,600	175,200
New Star Lake Water District 2	24	19	3,800	7,600	4,180	8,360
Existing Woodhaven Water District	32.5	30	6,000	12,000	6,600	13,200
New Woodhaven Water District 2	30	25	5,000	10,000	5,500	11,000
TOTALS	553.4	472.2	94,440	188,880	103,880	207,760
Newton Falls Water District	125	125	25,000	50,000	-	-

8.0 Project Financing

Based on the results of the 2010 U.S. Census income survey, the median household income of the Towns of Fine and Clifton are \$35,524 and \$42,805, respectively. Using NYSEFC's Current Hardship Policy as published in the 2013 Intended Use Plan (IUP) and the estimated EDU's within the proposed service area, the combined weighted MHI is \$36,346. While the Town of Fine Town wide MHI is representative of the portion of the service in the Town of Fine, the Town of Clifton MHI is not representative of the portion of the service area in the Town of Clifton primarily because the Town of Clifton includes the Hamlet of Cranberry Lake which has a significant amount of highly assessed lake front property. For this reason, an income survey is being completed for the service area in the Town of Clifton. The results of the income survey were not completed at the time of this report; however, it will be included as an amendment to the report if the results are sufficient to justify a different MHI than the Census.

Financing for the proposed project will be pursued primarily through NYS Environmental Facilities Corporation (NYSEFC). The project is anticipated to score high enough to be above the funding line for NYSEFC and therefore qualify for hardship financing. A project that is above the funding line and qualifies for hardship financing is eligible to receive up to a \$2 Million grant and a 30 year loan at 0% interest. Using the combined MHI of the project area, the NYSEFC Target Service Charge would be \$395.

The project also appears to be an excellent candidate to qualify for additional grants through the Community Development Block Grant (CDBG) and Local Government Efficiency Programs (LGE). Should the project qualify, it could be eligible for up to \$600,000 and \$400,000, respectively, from these programs.

It is also anticipated that the project would score high enough to be reached for subsidized financing through USDA RD. If the project qualified, it would be eligible for a 38 year loan at approximately 2.5% interest and up to a \$750,000 grant. Since the anticipated project service charge for USDA RD is substantially higher than that of NYSEFC (1.8% of MHI or \$654), financing through USDA RD would only be sought if subsidized hardship financing through NYSEFC was not obtained.

Project financing calculations are included in Table 10. With the assumption that the project would receive \$2 million in grant from NYSEFC, \$600,000 in grant from CDBG, \$400,000 in grant from LGE and the remaining capital costs for the proposed project financed through NYSEFC hardship financing for 30 years at 0% interest (levelized payments), the estimated annual **levelized** debt service payment would be \$139,733. The “50% rule” is commonly used in determining the debt service repayment schedule however infill and growth in the project service area is not anticipated. The “50% rule” is where the final year’s debt payment is 50% more than the first year’s payment. Due to the lack of projected infill and growth, 50% rule should not be used to determine the affordability for the project. For the purposes of this report, annual costs for equivalent users are based on levelized debt service payments. Revenues for payment of this debt service would be collected through a user fee for capital improvements paid by all property owners within the water district.

Operation and Maintenance costs would be accrued by all Districts within the project service area. Likewise, all users within the project service area would be responsible for contributing to Operation and Maintenance Costs. Estimated annual Operation and Maintenance costs are included within Table 9.

The following is a summary of estimated first-year user costs incurred by Water District Users:

Groundwater Option:

• Debt Service	\$252
• O&M	<u>\$206</u>
Total	\$458

Surface Water Option:

• Debt Service	\$137
• O&M	<u>\$355</u>
Total	\$492

The recommended project is based on the Groundwater Option as described above; however, if adequate quality and quantity of groundwater is unable to be located, the Surface Water Option improvements would be completed. Based on the estimated costs and financing scenario presented herein, the anticipated typical first-year user cost for the Groundwater Option is \$458 as shown in Table 10a. The anticipated typical first-year user cost for the Surface Water Option is \$492 as shown in Table 10b.

9.0 Environmental Review

This project will be subject to the New York State Environmental Quality Review Act (SEQR) as a Type 1 Action. The Town will prepare a full Environmental Assessment Form and address environmental considerations as identified by the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP), Adirondack Park Agency (APA), State and County Departments of Transportation, the Department of Health, and any other involved agencies that may require permits for construction. In addition, the Town will file a Joint Application for Permit from the U.S. Army Corp of Engineers and NYSDEC for wetlands, stream disturbance, and water supply. A map showing wetland locations along the proposed project corridor is included in Figures 6 and 7. A list of required permits and anticipated completion dates is below:

1. SEQR – November 2013
2. NYSOPRHP preliminary review – November 2013
3. USFWS preliminary review – November 2013
4. NYSOPRHP approval – September 2014
5. APA approval – March 2015
6. NYSDEC (water supply, wetlands, stream disturbance) approval – March 2015
7. USACOE (joint application for Permit) approval – March 2015
8. NYSDOH plan approval – March 2015
9. Funding agency plan approval – March 2015
10. State and County DOT approval – March 2015

10.0 Agricultural Districts

There are not any agricultural districts within or immediately adjacent to the project area.

11.0 Conclusions and Recommendations

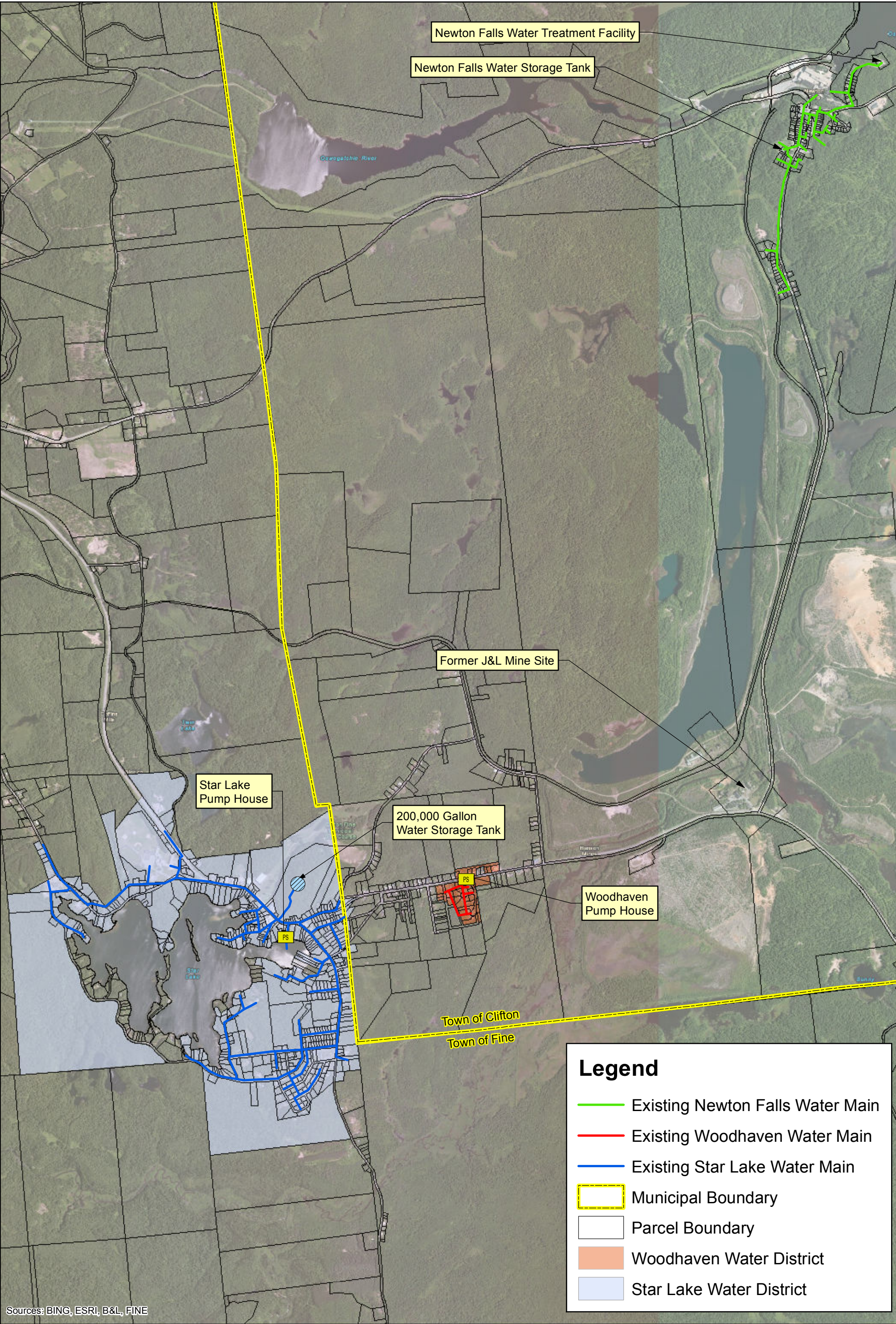
In summary, the proposed project consists of improvements to the Star Lake water treatment facility, a new water storage tank and water distribution system improvements replacing existing piping, expanding to additional users in need and interconnecting the Star Lake and Woodhaven water systems. Should an adequate supply of groundwater be located, a new groundwater treatment facility would be constructed in lieu of improvements to the Star Lake water treatment facility. If project funds are available due to locating an adequate groundwater source, favorable construction bids, or acquisition of additional grant funding, the project would replace additional water main, valves and hydrants within the Star Lake water system.

Improvements relating to an interconnection with and supplying water to or obtaining water from the Newton Falls water system are not included in the project at this time. The proposed improvements do; however, consider the regional needs of the communities involved including the needs of the Newton Falls water system, so as not to preclude a future interconnection.

It is recommended that this report be presented to the Department of Health and potential funding agencies. Additional steps to proceed include the following:

1. Submit PER to NYSEFC (August 2013)
2. Complete SEQR requirements (Fall 2013)
3. Complete income survey (Summer/Fall 2013)
4. Complete and submit DWSRF hardship application (Fall 2013)
5. Complete and submit DWSRF financial application (Winter 2013)
6. Form Water District Extensions (Winter 2013/Spring 2014)
7. Develop Inter-municipal agreements (Spring 2014)
8. Pass Bond resolutions (Spring 2014)
9. Secure DWSRF short-term financing (Summer 2014)
10. Commence environmental field work/permitting (Summer 2014)
11. Prepare design plans and specifications (Summer 2014/Winter 2014)
12. Secure regulatory and funding agency approvals (Winter 2014/Spring 2015)
13. Receive bids and award construction contracts (Spring 2015)
14. Construction of proposed facilities and infrastructure (Spring 2015 thru Spring 2016)

Figure 1
Existing Water System Map



Sources: BING, ESRI, B&L, FINE



1 inch = 2,000 feet

Figure 2

Preliminary Surficial Mapping

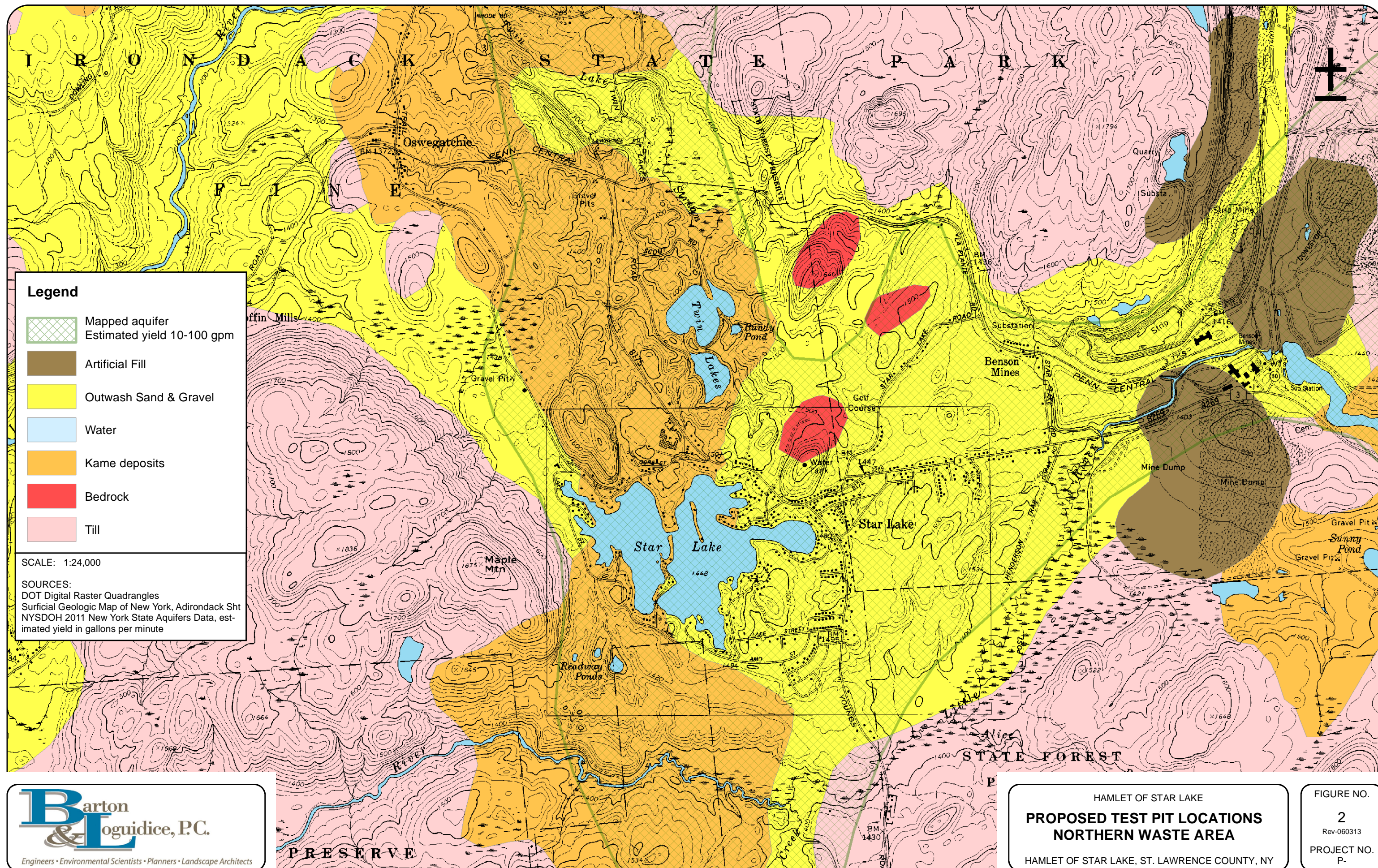
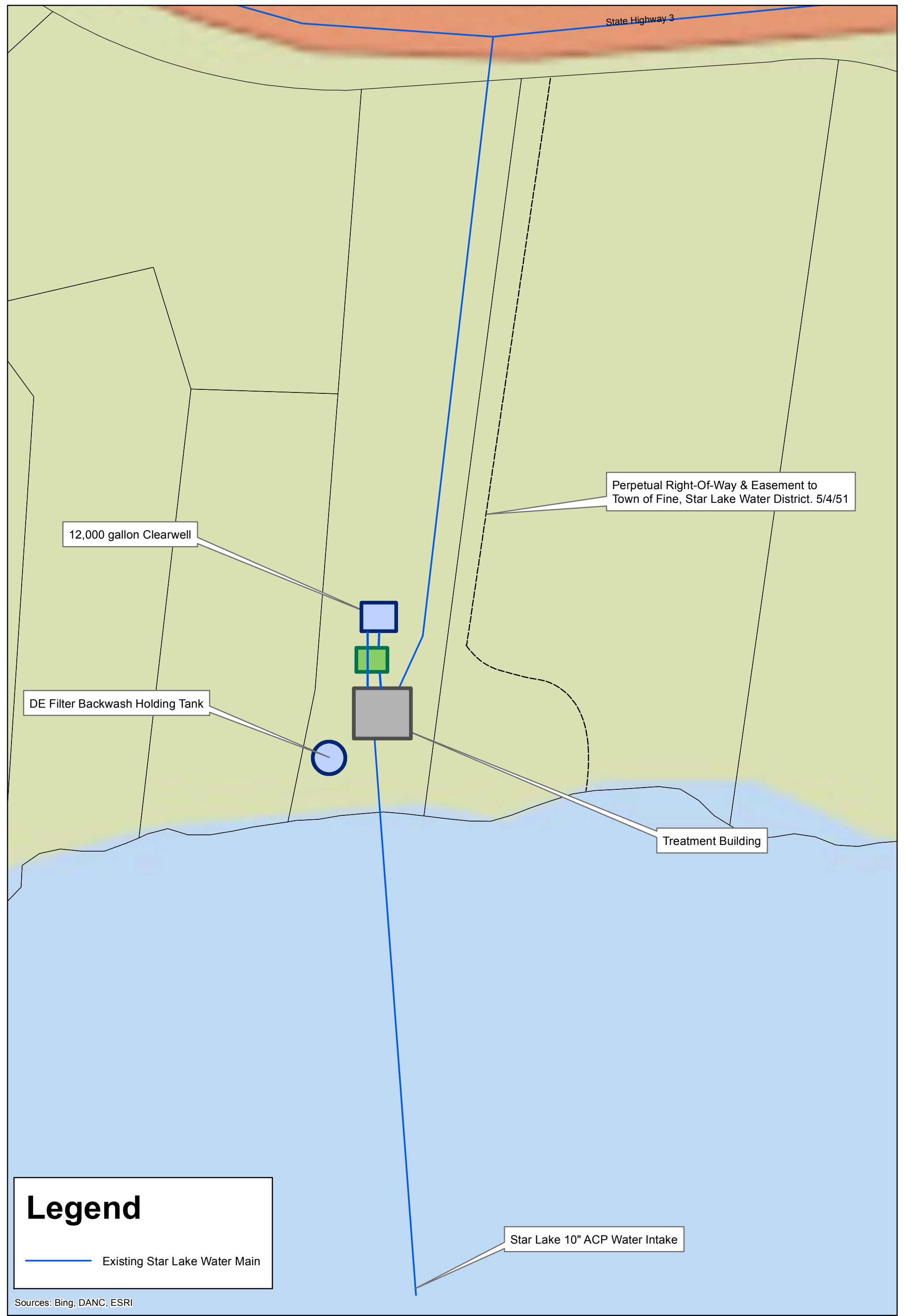


Figure 3

Star Lake Water Plant – Existing Site Plan



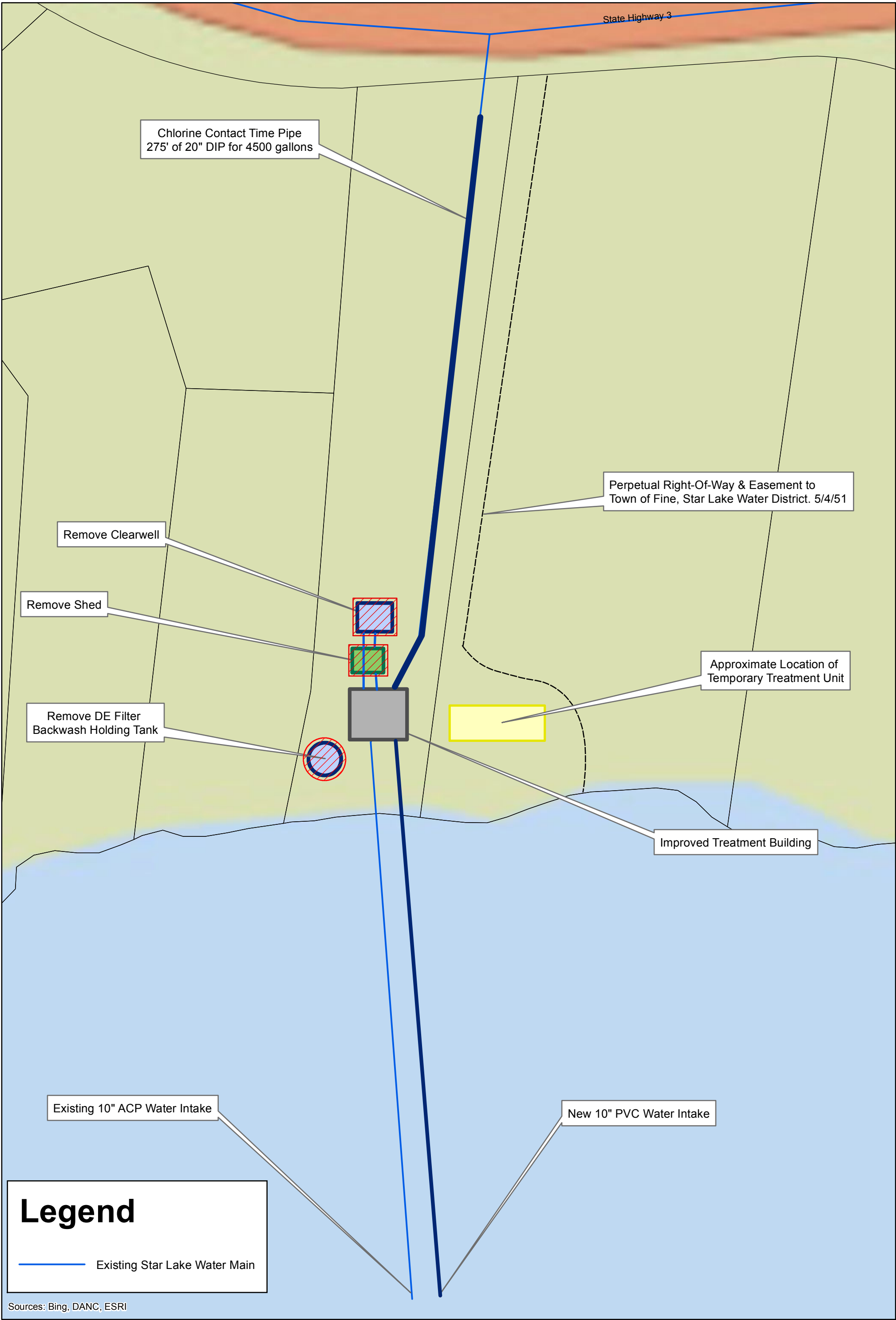
Legend

Existing Star Lake Water Main

Sources: Bing, DANC, ESRI

Figure 4

Star Lake Water Plant – Potential Improvements Site Plan



Legend

Existing Star Lake Water Main

Sources: Bing, DANC, ESRI

Figure 5a

**Proposed Water System Improvements Map
Groundwater Option**

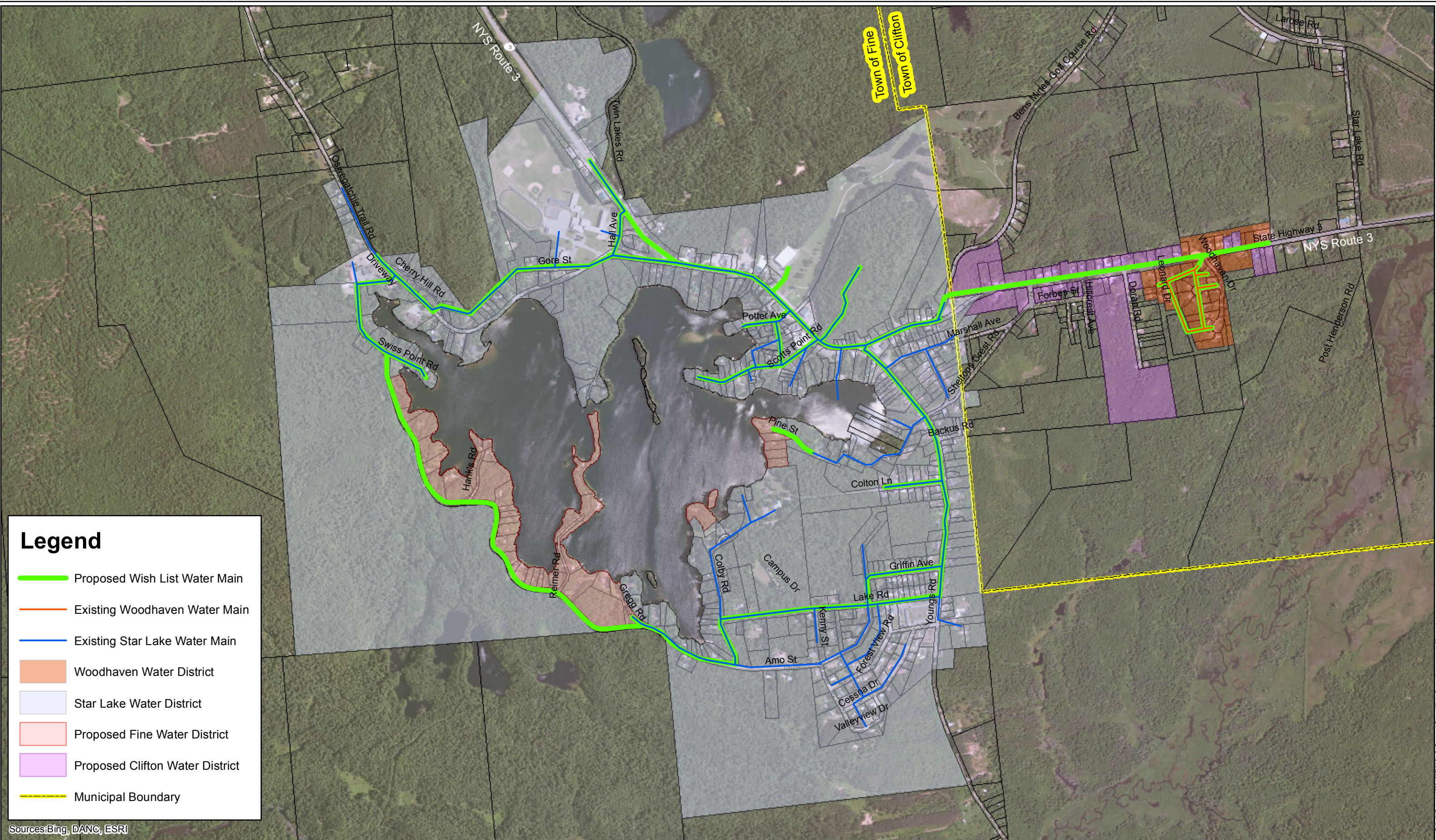


Figure 5b

**Proposed Water System Improvements Map
Surface Water Option**



Legend

- Existing Woodhaven Water Main
- Existing Star Lake Water Main
- Proposed Water Main Improvements
- Woodhaven Water District
- Star Lake Water District
- Proposed Fine Water District
- Proposed Clifton Water District
- Municipal Boundary

Sources: Bing, DANC, ESRI

Figure 6
APA Wetlands

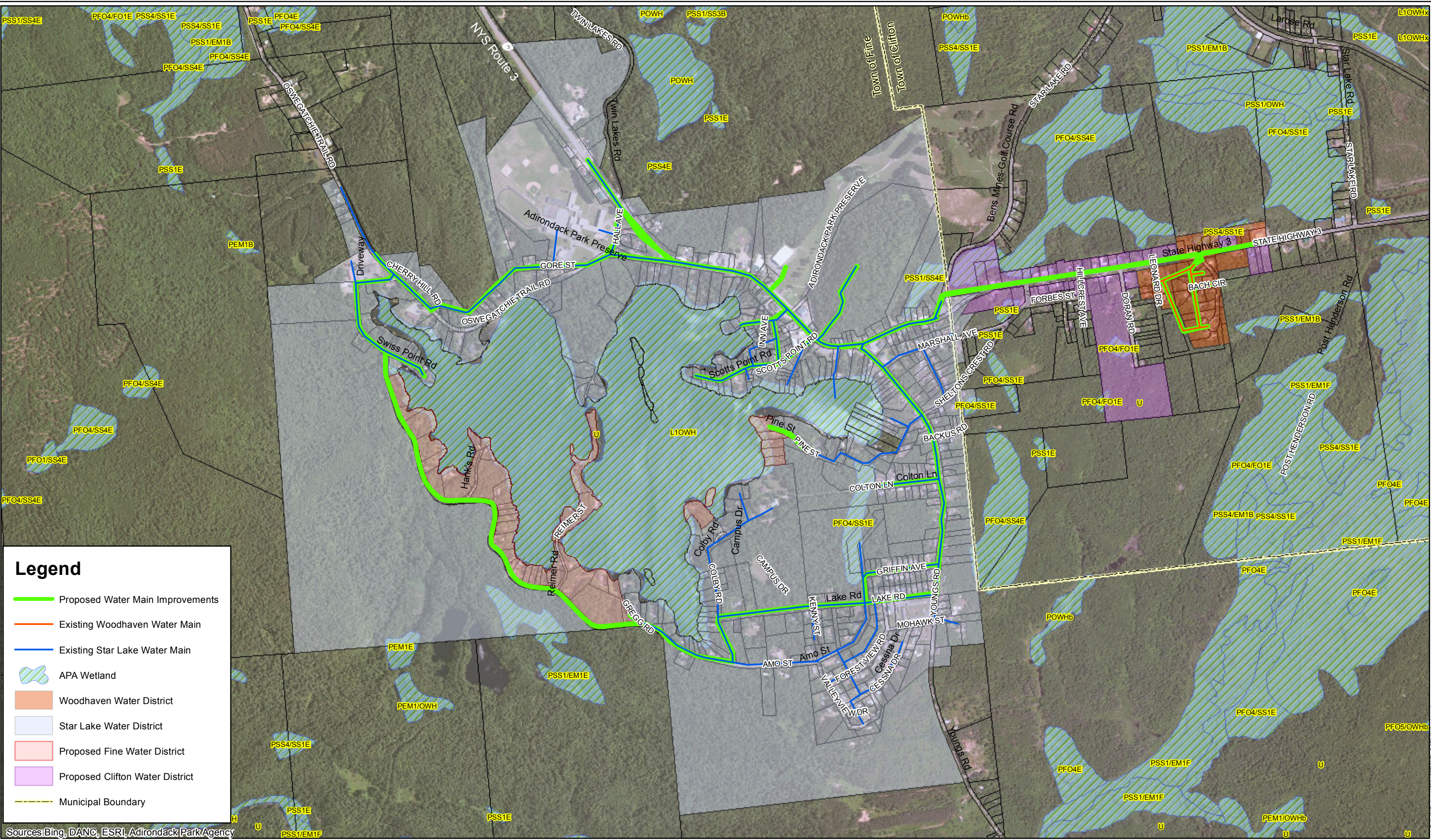


Figure 7
NWI Wetlands

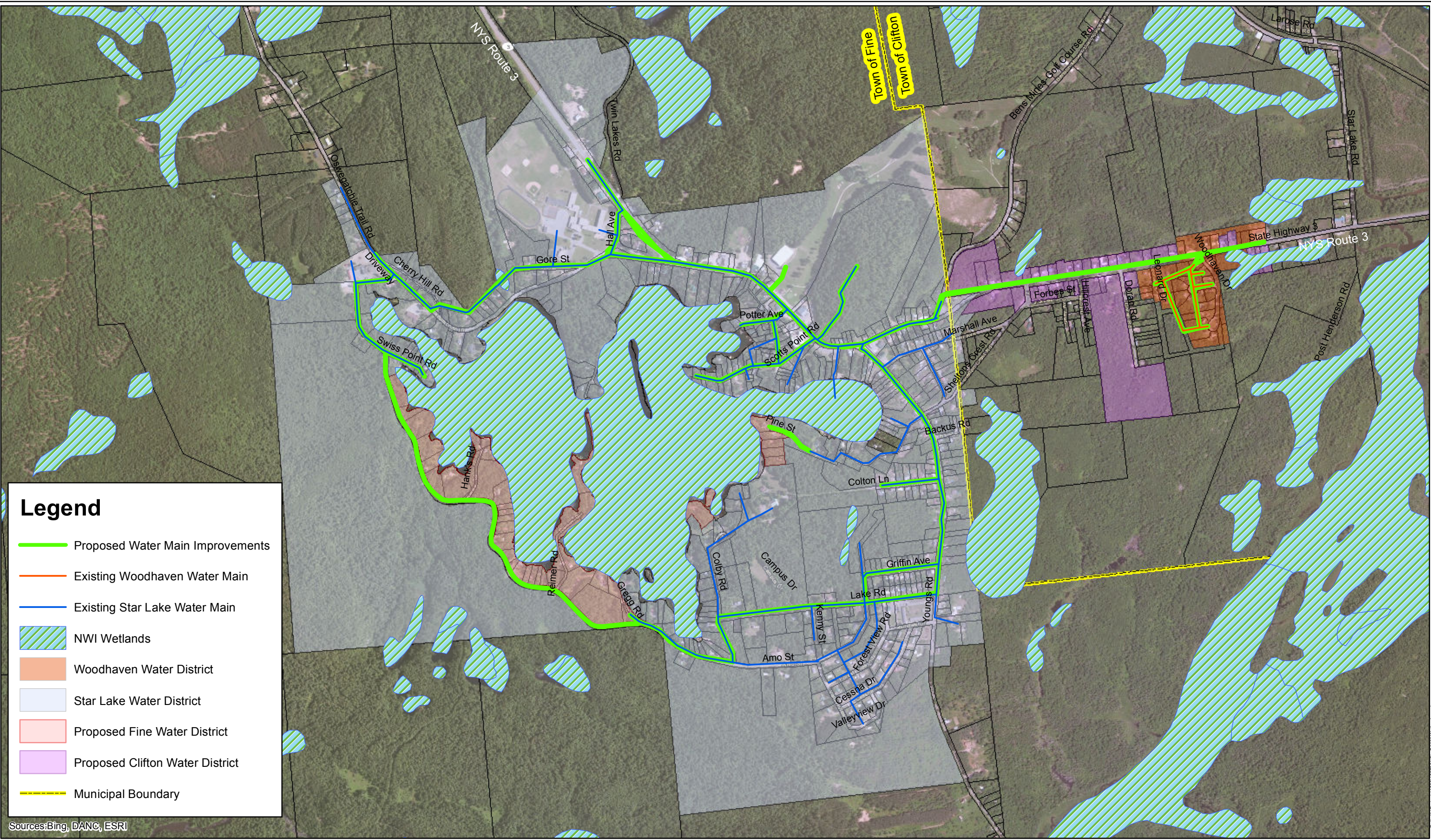


Table 1

**Estimated Project Cost –
Rehabilitation of Existing Star Lake Facility**

Star Lake Water System Improvements

Table 1 Estimated Project Cost - Rehabilitation of Existing Star Lake Facility

Item	Description	Quantity	Units	Unit Cost	Total
1	Demolition	1	LS	\$40,000	\$40,000
1	New Electrical and Mechanical equipment	1	LS	\$68,000	\$68,000
2	Painting, concrete patching and sealing	1	LS	\$12,000	\$12,000
3	New windows and doors	1	LS	\$12,000	\$12,000
4	New roofing and trim	1	LS	\$38,000	\$38,000
5	Allowance for wall improvements to support roof	1	LS	\$45,000	\$45,000
6	Harmsco Filtration System	1	LS	\$294,000	\$294,000
7	New high lift pumps	2	EA	\$35,000	\$70,000
8	Station piping	1	LS	\$30,000	\$30,000
9	New chemical feed equipment	1	LS	\$45,000	\$45,000
10	Paving and Site Restoration/Improvements	1	LS	\$25,000	\$25,000
11	New Chlorine Contact piping	200	LF	\$75	\$15,000
12	Miscellaneous Site Work	1	LS	\$15,000	\$15,000
13	Instrumentation and Controls	1	LS	\$80,000	\$80,000
14	New Surface Water Intake Piping	270	LF	\$500	\$135,000
15	Surface Water Intake Improvements	1	LS	\$20,000	\$20,000
16	Temporary Treatment System set-up	1	LS	\$15,000	\$15,000
17	Temporary Treatment System rental	12	Week	\$8,000	\$96,000
				Subtotal	\$1,055,000
			Inflation to 2015	8%	\$85,000
			Contingency	10%	\$106,000
			Subtotal Construction Costs		\$1,246,000
			Well Development/Exploration		\$200,000
			Engineering/Legal/Administrative	25%	\$312,000
			Total		\$1,758,000

Table 2

Estimated Project Cost –
New Woodhaven Groundwater Treatment Facility

Star Lake Water System Improvements

Table 2 Estimated Project Cost - New Woodhaven Groundwater Treatment Facility (without fire protection)

Item	Description	Quantity	Units	Unit Cost	Total
1	Demolition of Existing Buildings	1	LS	\$30,000	\$30,000
2	New Water Treatment Building	700	SF	\$300	\$210,000
3	Chemical Feed System	1	LS	\$40,000	\$40,000
4	Chlorine contact piping	200	LF	\$75	\$15,000
5	Instrumentation and Controls	1	LS	\$60,000	\$60,000
6	Well Redevelopment and Pump Replacement	1	LS	\$40,000	\$40,000
7	Paving and Site Restoration	1	LS	\$25,000	\$25,000
8	Miscellaneous Site Work	1	LS	\$30,000	\$30,000
			Construction Subtotal		\$450,000
			Inflation to 2015	8%	\$36,000
			Contingency	10%	\$45,000
			Subtotal Construction Costs		\$531,000
			Engineering/Legal/Administrative		25%
					\$133,000
			Total		\$664,000

Estimated Project Cost - New Woodhaven Groundwater Treatment Facility (fire protection adder)

Item	Description	Quantity	Units	Unit Cost	Total
1	Water Treatment Building Addition	200	SF	\$300	\$60,000
2	Fire Pumps	2	EA	\$30,000	\$60,000
3	120,000 gallon fire storage tank	1	LS	\$220,000	\$220,000
4	Site water main	200	LF	\$75	\$15,000
			Construction Subtotal		\$355,000
			Inflation to 2015	8%	\$29,000
			Contingency	10%	\$36,000
			Subtotal Construction Costs		\$420,000
			Engineering/Legal/Administrative		25%
					\$105,000
			Total		\$525,000

Table 3

Estimated Project Cost –
New Joint Groundwater Treatment Facility

Star Lake Water System Improvements

Table 3 Estimated Project Cost - New Joint Groundwater Treatment Facility

Item	Description	Quantity	Units	Unit Cost	Total
1	New Water Treatment Building	720	SF	\$300	\$216,000
2	Chemical Feed System	1	LS	\$45,000	\$45,000
3	Instrumentation and Controls	1	LS	\$100,000	\$100,000
4	Access Road and Site Improvements	1	LS	\$50,000	\$50,000
5	Site piping	1,200	LF	\$75	\$90,000
6	Miscellaneous Site Work	1	LS	\$50,000	\$50,000
7	New well, pitless adapter and submersible pump	2	EA	\$90,000	\$180,000
				Total	\$731,000
			Inflation to 2015	8%	\$59,000
			Contingency	10%	\$74,000
			Subtotal Construction Costs		\$864,000
			Well Development/Exploration		\$200,000
			Engineering/Legal/Administrative	25%	\$216,000
				Total	\$1,280,000

Table 4

**Estimated Project Cost –
Tank Rehabilitation**

Star Lake Water System Improvements

Table 4 Estimated Project Cost - Tank Rehabilitation

Item	Description	Quantity	Units	Unit Cost	Total
1	Interior coating removal and re-coat	4,326	SF	\$32	\$138,432
2	Exterior spot repair and re-coat	4,326	SF	\$14	\$60,564
3	Vent, overflow and ladder improvements	1	LS	\$24,000	\$24,000
4	Tank pressure transmitter, vault, telemetry	1	LS	\$40,000	\$40,000
5	Miscellaneous Site Work	1	LS	\$10,000	\$10,000
				Total	\$272,996
			Inflation to 2015	8%	\$22,000
			Contingency	10%	\$28,000
			Subtotal Construction Costs		\$323,000
		Engineering/Legal/Administrative		25%	\$81,000
				Total	\$404,000

Table 5

**Estimated Project Cost –
Tank Replacement**

Star Lake Water System Improvements

Table 5 Estimated Project Cost - Tank Replacement

Item	Description	Quantity	Units	Unit Cost	Total
1	New Glass Fused to Steel Water Storage Tank	250,000	Gal	\$1.50	\$375,000
2	New Water Storage Tank Foundation	1	LS	\$70,000	\$70,000
3	Tank pressure transmitter, vault, telemetry	1	LS	\$40,000	\$40,000
4	Demolition of existing Tank	1	LS	\$30,000	\$30,000
5	Miscellaneous Site Work	1	LS	\$10,000	\$10,000
				Total	\$525,000
			Inflation to 2015	8%	\$42,000
			Contingency	10%	\$53,000
			Subtotal Construction Costs		\$620,000
		Engineering/Legal/Administrative		25%	\$155,000
				Total	\$775,000

Table 6a

**Estimated Project Cost – Water Main Improvements
Groundwater Option**

Star Lake Water System Improvements
Table 6a Cost Estimate - Water Main Improvements - Groundwater Option

Item	Description	Type	Length (ft)	Main Size	Valves	Hydrants	Services Near Side	Services Far Side	Private Services	Connection to Existing Main	New Water Meter Install	Main	Valves	Hydrants	Services Near Side	Services Far Side	Private Services	Connection to Existing	Water Meters
	Town of Fine																		
1	State Highway 3	Replacement	5,270.00	8	10	9	16	16	0	6	32	\$342,550.00	\$12,000.00	10,800.00	\$11,200.00	\$19,200.00	\$0	\$18,000	\$19,200
2	School Street	Replacement	760.00	8	1	1	4	0	0	0	4	\$49,400.00	\$1,200.00	3,400.00	\$2,800.00	\$0.00	\$0	\$0	\$2,400
3	Hall Ave	Replacement	540.00	8	2	1	2	1	0	2	3	\$35,100.00	\$2,400.00	2,500.00	\$1,400.00	\$1,200.00	\$0	\$6,000	\$1,800
4	Lake Road	New	4,900.00	8	7	8	17	0	2550	2	17	\$318,500.00	\$8,400.00	27,200.00	\$11,900.00	\$0.00	\$51,000	\$6,000	\$10,200
5	Pine Street	New	500.00	8	1	1	5	0	1000	1	5	\$32,500.00	\$1,200.00	3,400.00	\$3,500.00	\$0.00	\$20,000	\$3,000	\$3,000
6	Golf Course	New	0.00	8	1	0	1	0	300	1	1	\$0.00	\$1,200.00	0.00	\$700.00	\$0.00	\$6,000	\$3,000	\$600
7	Water Meters	New	0.00	8	0	0	0	0	0	0	117	\$0.00	\$0.00	0.00	\$0.00	\$0.00	\$0	\$0	\$70,200
8	Oswegatchie Trail Road	Replacement	940.00	8	4	2	4	3	0	2	7	\$61,100.00	\$4,800.00	6,800.00	\$2,800.00	\$3,600.00	\$0	\$6,000	\$4,200
9	Youngs Road	Replacement	3,230.00	8	11	5	17	23	0	7	40	\$209,950.00	\$13,200.00	17,000.00	\$11,900.00	\$27,600.00	\$0	\$21,000	\$24,000
10	NYS Rt. 3 to Tank	Replacement	1,050.00	8	2	1	0	0	0	1	0	\$68,250.00	\$2,400.00	3,400.00	\$0.00	\$0.00	\$0	\$3,000	\$0
11	Swiss Point Road	Replacement	1,800.00	8	4	3	11	5	0	1	16	\$117,000.00	\$4,800.00	10,200.00	\$7,700.00	\$6,000.00	\$0	\$3,000	\$9,600
12	Lake Rd (Youngs to Gregg)	Replacement	4,400.00	8	7	7	20	14	0	2	34	\$286,000.00	\$8,400.00	23,800.00	\$14,000.00	\$16,800.00	\$0	\$6,000	\$20,400
13	Scott's Point Road	Replacement	1,800.00	8	4	3	27	12	0	1	39	\$117,000.00	\$4,800.00	10,200.00	\$18,900.00	\$14,400.00	\$0	\$3,000	\$23,400
14	Inn Ave	Replacement	450.00	8	3	0	3	3	0	2	6	\$29,250.00	\$3,600.00	0.00	\$2,100.00	\$3,600.00	\$0	\$6,000	\$3,600
15	Potter Ave	Replacement	800.00	8	1	1	11	5	0	1	16	\$52,000.00	\$1,200.00	3,400.00	\$7,700.00	\$6,000.00	\$0	\$3,000	\$9,600
16	Colton Lane	Replacement	650.00	8	1	1	6	6	0	1	12	\$42,250.00	\$1,200.00	3,400.00	\$4,200.00	\$7,200.00	\$0	\$3,000	\$7,200
17	Griffin Ave	Replacement	1,140.00	8	4	1	8	7	0	2	15	\$74,100.00	\$4,800.00	3,400.00	\$5,600.00	\$8,400.00	\$0	\$6,000	\$9,000
18	Gore St. & Cherry Hill Rd	Replacement	1,960.00	8	3	3	11	3	0	0	14	\$127,400.00	\$3,600.00	10,200.00	\$7,700.00	\$3,600.00	\$0	\$0	\$8,400
19	Misc. Hydrants and valves	Replacement	0.00	8	9	11	0	0	0	0	0	\$0.00	\$10,800.00	37,400.00	\$0.00	\$0.00	\$0	\$0	\$0
	Total (Item Nos. 1 - 18)		30,190	152	75	58	163	98	3850	32	378	\$1,962,350	\$90,000	\$176,500	\$114,100	\$117,600	\$77,000	\$96,000	\$226,800
																		Total	\$2,860,350
															Inflation to 2015			8%	\$229,000
															Contingency			10%	\$287,000
																Subtotal Construction Costs			\$3,377,000
															Engineering/Legal/Administrative			25%	\$845,000
																		Total	\$4,222,000
Item	Description	Type	Length (ft)	Main Size	Valves	Hydrants	Services Near Side	Services Far Side	Private Services	Connection to Existing Main	New Water Meter Install	Main	Valves	Hydrants	Services Near Side	Services Far Side	Private Services	Connection to Existing	Water Meters
	Town of Clifton																		
	Town of Clifton																		
8	State Highway 3	New	3,000.00	8	3	5	12	13	3750	0	25	\$195,000.00	\$3,600.00	17,000.00	\$8,400.00	\$15,600.00	\$75,000	\$0	\$15,000
9	Woodhaven	Replacement	2,100.00	8	4	2	20	10	4500	0	30	\$136,500.00	\$4,800.00	6,800.00	\$14,000.00	\$12,000.00	\$90,000	\$0	\$18,000
	Total (Items 8 & 9)		5,100	16	7	7	32	23		0	55	\$331,500	\$8,400	\$23,800	\$22,400	\$27,600	\$165,000	\$0	\$33,000
																		Total	\$611,700
															Inflation to 2015			8%	\$49,000
															Contingency			10%	\$62,000
																Subtotal Construction Costs			\$723,000
															Engineering/Legal/Administrative			25%	\$181,000
																		Total	\$904,000

Total Distribution Components

12 Inch Water Main	LF	\$75	Near Side Service	EA	\$700	
8 Inch Water Main	LF	\$65	Far Side Service	EA	\$1,200	
Complete Hydrant Assembly	EA	\$3,400	Water Service laterals	LF	\$20	
12 Inch valve	EA	\$2,500	Connection to Existing	EA	\$3,000	
8 Inch Valve	EA	\$1,200	New Water Meter Inst	EA	\$600	

Total \$5,126,000

Table 6b

**Estimated Project Cost – Water Main Improvements
Surface Water Option**

Star Lake Water System Improvements

Table 6b Cost Estimate - Water Main Improvements - Surface Water Option

[illegible]

Total Distribution Components						
12 Inch Water Main	LF	\$75	Near Side Service	EA	\$700	Total \$2,739,000
8 Inch Water Main	LF	\$65	Far Side Service	EA	\$1,200	
Complete Hydrant Assembly	EA	\$3,400	Water Service laterals	LF	\$20	
12 Inch valve	EA	\$2,500	Connection to Existing	EA	\$3,000	
8 Inch Valve	EA	\$1,200	New Water Meter Instal	EA	\$600	

Table 7

Summary of Alternative Project Cost Estimates

Star Lake Water System Improvements

Table 7 - Summary of Alternative Project Cost Estimates

Description				Total
Water Source Improvements				
Rehab of Existing Star Lake Treatment Facility				\$1,758,000.00
New Woodhaven Groundwater Treatment Facility				\$664,000.00
New Joint Groundwater Treatment supply and Facility				\$1,280,000.00
Water Tank Improvements				
Rehab Existing 200,000 gallon Star Lake Water Storage Tank				\$404,000.00
New 250,000 gallon Star Lake Water Storage Tank				\$775,000.00
Water Main Improvements				
Surface Water Option				
Town of Fine Water Main Improvements				\$1,835,000.00
Town of Clifton Water Main Improvements				\$904,000.00
Groundwater Option				
Town of Fine Water Main Improvements				\$4,222,000.00
Town of Clifton Water Main Improvements				\$904,000.00

Table 8

Estimated Project Cost – Recommended Project

Star Lake Water System Improvements

Table 8 - Estimated Project Cost - Recommended Projects

Description				Total
Groundwater Option				
New Joint Groundwater Treatment Facility from Table 3				\$1,280,000.00
New/Replacement Water Main (Town of Clifton) from Table 6a				\$904,000.00
New/Replacement Water Main (Town of Fine) from Table 6a				\$4,222,000.00
New Water Storage Tank from Table 5				\$775,000.00
Woodhaven Debt refinance				\$10,770.00
		Total Estimated Project Capital Cost		\$7,192,000.00
Surface Water Option*				
Rehabilitation of Existing Star Lake Facility from Table 1				\$1,758,000.00
New/Replacement Water Main (Town of Clifton) from Table 6b				\$904,000.00
New/Replacement Water Main (Town of Fine) from Table 6b				\$1,835,000.00
New Water Storage Tank from Table 5				\$775,000.00
Woodhaven Debt refinance				\$10,770.00
		Total Estimated Project Capital Cost		\$5,282,770.00
* The "Surface Water Option" would only be pursued if adequate quantity and quality of groundwater is unable to be located.				

Table 9

Estimated Annual Operation & Maintenance Costs

Star Lake Water System Improvements

Table 9 - Estimated Annual Operation & Maintenance Costs

Description	2013 budget	Total O&M Estimated 2015	Town of Clifton Estimated 2015	Town of Fine Estimated 2015
Existing O&M (based on 2013 budget)				
Star Lake wages, insurance and benefits	\$81,038	\$86,000		\$86,000
Star Lake contractual expenses (power, chemicals, etc.)	\$47,060	\$49,900		\$49,900
Star Lake Equipment and Capital Outlay	\$18,000	\$19,100		\$19,100
Woodhaven wages, insurance and benefits	\$5,060	\$5,400	\$5,400	
Woodhaven contractual expenses	\$7,590	\$8,100	\$8,100	
TOTAL	\$158,748	\$168,500	\$13,500	\$155,000
Projected O&M new Joint groundwater Facility (Groundwater Option)				
Star Lake wages, insurance and benefits		\$50,000	\$2,500	\$47,500
Star Lake contractual expenses (power, chemicals, etc.)		\$25,000	\$1,350	\$23,650
Star Lake Equipment and Capital Outlay		\$15,000	\$0	\$15,000
Woodhaven contract operator expenses		\$4,500	\$4,500	\$0
Woodhaven Equipment and Capital Outlay		\$3,000	\$3,000	\$0
TOTAL		\$97,500	\$11,350	\$86,150
Projected O&M rehab Star Lake (Surface Water Option)				
Star Lake wages, insurance and benefits		\$80,000	\$7,000	\$73,000
Star Lake contractual expenses (power, chemicals, etc.)		\$65,000	\$5,000	\$60,000
Star Lake Equipment and Capital Outlay		\$15,000	\$0	\$15,000
Woodhaven contract operator expenses		\$4,500	\$4,500	\$0
Woodhaven Equipment and Capital Outlay		\$3,000	\$3,000	\$0
TOTAL		\$167,500	\$19,500	\$148,000
Clifton O&M EDU's	55			
Fine O&M EDU's	417			

Table 10a

User Cost Estimate Groundwater Option

Star Lake Water System Improvements

Table 10a User Cost Estimate - Groundwater Option

Description			
2010 Town of Clifton Median Household Income	\$42,805		
2010 Town of Fine Median Household Income	\$35,524		
Total Estimated Project Cost of Groundwater Option (From Table 8)			\$7,192,000
	Debt Service EDU's	O&M EDU's	
Town of Clifton EDU's	62.50	55.00	
Town of Fine EDU's	490.90	417.20	
Total Number of EDU's	553.40	472.20	
<u>DWSRF 30 Year Payments @ 0% Interest</u>			
Composite MHI (weighted per EDU's and MHI's from each Town above)	\$36,346		
Composite Target Service Charge (Using 2013 IUP Formula)	\$395.61		
CDBG Grant			\$400,000
LGE Grant			\$600,000
DWSRF Grant			\$2,000,000
Total Estimated Project Cost Less Grant / Outside Contribution			\$4,192,000
Annualized Total Estimated Debt Service (levelized debt payments)			\$139,733
Town of Clifton Annual Operation & Maintenance (O&M) - Groundwater Option from Table 9			\$11,350
Town of Fine Annual Operation & Maintenance (O&M) - Groundwater Option from Table 9			\$86,150
Annual User Costs		Town of Fine	Town of Clifton
Annual Debt payment (levelized payments)		\$252	\$252
Annual Operation & Maintenance / Water purchase costs (rehab existing star lake filter plant)		\$206	\$206
TOTAL ANNUAL WATER COST (levelized debt payments) - GROUNDWATER		\$458	\$458

Table 10b

User Cost Estimate Surface Water Option

Star Lake Water System Improvements

Table 10b User Cost Estimate - Surface Water Option

Description			
2010 Town of Clifton Median Household Income	\$42,805		
2010 Town of Fine Median Household Income	\$35,524		
Total Estimated Project Cost of Surface Water Option (From Table 8)			\$5,282,770
	Debt Service EDU's	O&M EDU's	
Town of Clifton EDU's	62.50	55.00	
Town of Fine EDU's	490.90	417.20	
Total Number of EDU's	553.40	472.20	
<u>DWSRF 30 Year Payments @ 0% Interest</u>			
Composite MHI (weighted per EDU's and MHI's from each Town above)	\$36,346		
Composite Target Service Charge (Using 2013 IUP Formula)	\$395.61		
CDBG Grant			\$400,000
LGE Grant			\$600,000
DWSRF Grant			\$2,000,000
Total Estimated Project Cost Less Grant / Outside Contribution			\$2,282,770
Annualized Total Estimated Debt Service (levelized debt payments)			\$76,092
Town of Clifton Annual Operation & Maintenance (O&M) - Surface Water Option from Table 9			\$19,500
Town of Fine Annual Operation & Maintenance (O&M - Surface Water Option from Table 9			\$148,000
Annual User Costs		Town of Fine	Town of Clifton
Annual Debt payment (levelized payments)		\$137	\$137
Annual Operation & Maintenance / Water purchase costs (rehab existing star lake filter plant)		\$355	\$355
TOTAL ANNUAL WATER COST (levelized debt payments)- SURFACE WATER		\$492	\$492

Exhibit 1

Interest Survey Results

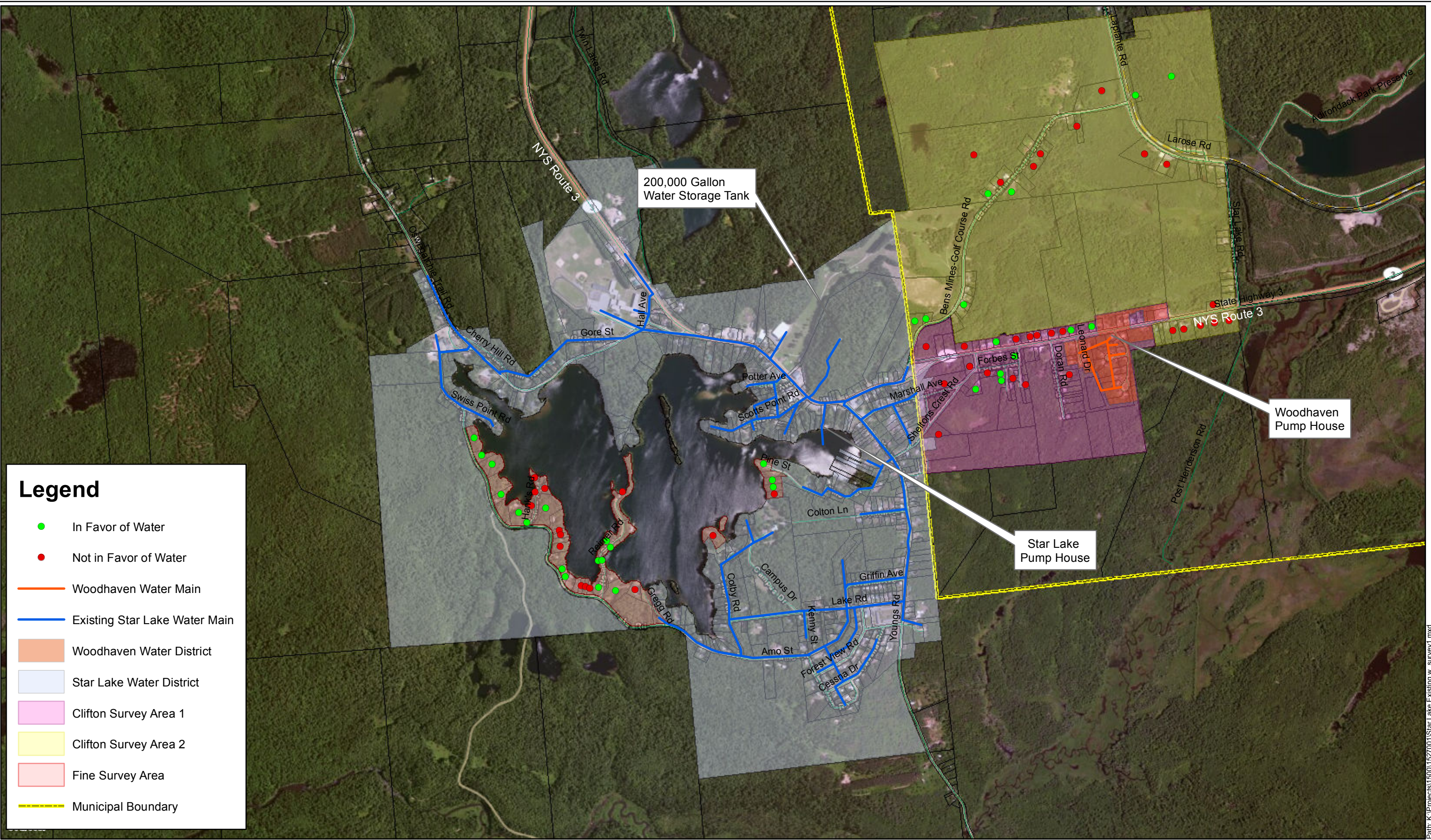


Exhibit 2

Preliminary EDU Assessment

Town of Clifton Existing Users

Road Name	Tax Map No.	Property Class Code	Description	EDU	Code	Notes
Bach Circle	224.031-2-20	210		1.00	1	
	224.031-2-20	210		1.00	1	
	224.031-2-21	210		1.00	1	
	224.031-2-22	210		1.00	1	
	224.031-2-23	210		1.00	1	
	224.031-2-26	210		1.00	1	
	224.031-2-27	210		1.00	1	
	224.031-2-28	210		1.00	1	
	224.031-2-29	210		1.00	1	
Leonard Drive	224.031-2-29	210		1.00	1	
	224.031-2-1	210		1.00	1	
	224.031-2-24	210		1.00	1	
	224.031-2-25	210		1.00	1	
	224.031-3-2	210		1.00	1	
State Highway 3	224.031-3-4	210		1.00	1	
	224.031-3-5.2	311		0.50	5	
	224.031-1-13	312		0.50	5	
	224.031-1-14	210		1.00	1	
	224.031-1-15	260		1.00	3	
	224.031-1-16	210		1.00	1	
	224.031-1-19.1	314		0.50	5	
	224.031-1-19.2	314		0.50	5	
	224.031-1-20	432		1.00	4	Service & Gas Station
	224.031-2-2	314		0.50	5	
Woodhaven Drive	224.031-2-5	210		1.00	1	
	224.031-2-15	210		1.00	1	
	224.031-2-15	210		1.00	1	
	224.031-2-16	210		1.00	1	
	224.031-2-17	210		1.00	1	
	224.031-2-18	210		1.00	1	
	224.031-2-18	210		1.00	1	
	224.031-2-19	210		1.00	1	
	224.031-2-19	210		1.00	1	
	224.031-2-3	822		0.00	4	Water Supply
	224.031-2-4.11	210		1.00	1	
	224.031-2-4.11	210		1.00	1	
TOTAL EXISTING				32.50		
Single family residential (1)				28.00	EDUs	
Multi-family residential (2)				0.00	EDUs	
Seasonal residential (3)				1.00	EDUs	
Commercial (4)				1.00	EDUs	
Vacant (5)				2.50	EDUs	
TOTAL EXISTING				32.50		
TOTAL EXISTING O&M EDUS				30.00		

Town of Clifton New Users

Road Name	Tax Map No.	Property Class Code	Description	EDU	Code	Notes
Doran Road	224.031-3-1	210		1.00	1	
Hillcrest Drive	224.031-4-10	210		1.00	1	
Marshall Avenue	224.030-10-3	314		0.50	5	
State Highway 3	224.000-6-2.1	240		1.00	1	
	224.030-10-2	210		1.00	1	
	224.030-8-11	210		1.00	1	
	224.030-8-5	210		1.00	1	
	224.030-8-6	432		1.00	4	Service & Gas Station
	224.030-8-7	210		1.00	1	
	224.030-8-8	314		0.50	5	
	224.030-8-9	210		1.00	1	
	224.031-1-10	210		1.00	1	
	224.031-1-11	314		0.50	5	
	224.031-1-17	210		1.00	1	
	224.031-1-18	210		1.00	1	
	224.031-1-2	210		1.00	1	
	224.031-1-21	220		2.00	2	
	224.031-1-3	210		1.00	1	
	224.031-1-4	314		0.50	5	
	224.031-1-5	312		0.50	5	
	224.031-1-6	210		1.00	1	
	224.031-1-7	210		1.00	1	
	224.031-1-8	210		1.00	1	
	224.031-1-9	311		0.50	5	
	224.031-2-7	210		1.00	1	
	224.031-2-8	210		1.00	1	
	224.031-2-9	210		1.00	1	
	224.031-4-1	210		1.00	1	
	224.031-4-2	270		1.00	1	
	224.031-4-20	480		0.50	5	Multiple Use (Vacant w/ abandoned building)
	224.031-4-21	314		0.50	5	
	224.031-4-3	311		0.50	5	
	224.031-4-5	210		1.00	1	
	224.031-4-6	311		0.50	5	

TOTAL NEW 30.0

Single family residential (1) 22.00 EDUs
Multi-family residential (2) 2.00 EDUs
Seasonal residential (3) 0.00 EDUs
Commercial (4) 1.00 EDUs
Vacant (5) 5.00 EDUs

TOTAL NEW 30.0

TOTAL NEW O&M EDUS 25.0

Town of Fine Existing Users

Road Name	Tax Map No.	Property Class Code	Description	EDU	Code	Notes
Amo Street	224.000-5-2	240		1.00	1	
	224.045-1-29.11	311		0.50	5	
	224.045-1-36	210		1.00	1	
	224.046-5-4	311		0.50	5	
	224.046-5-7	311		0.50	5	
	224.046-6-10.1	210		1.00	1	
	224.046-6-11	210		1.00	1	
	224.046-6-14	270		1.00	1	
	224.046-6-15.1	210		1.00	1	
	224.046-6-16	311		0.50	5	
	224.046-6-17.1	210		1.00	1	
Backus Road	224.038-2-5.2	311		0.50	5	
	224.038-2-6.1	416		0.50	4	
	224.038-2-6.1	416		0.50	4	
Benson Mines Golf Course	224.030-3-7	311		0.50	5	
Campus Drive	224.037-3-3.1	613		1.00	4	79,100 is average annual water usage
	224.037-3-12	210		1.00	1	
	224.037-3-13	260		1.00	3	
	224.037-3-14	260		1.00	3	
Catherine Street	224.030-4-10	311		0.50	5	
	224.030-4-11	210		1.00	1	
	224.030-4-12	210		1.00	1	
	224.030-4-13	210		1.00	1	
	224.030-4-14.1	311		0.50	5	
	224.030-4-16	210		1.00	1	
	224.030-4-17	210		1.00	1	
	224.030-4-18	210		1.00	1	
	224.030-4-19	210		1.00	1	
	224.030-4-20	210		1.00	1	
	224.030-4-4	210		1.00	1	
	224.030-4-9	312		0.50	5	
	224.038-2-1	210		1.00	1	
	224.038-2-2	210		1.00	1	
	224.038-2-23	312		0.50	5	
Cessna Drive	224.046-3-10	270		1.00	1	
	224.046-3-11	270		1.00	1	
	224.046-3-13	270		1.00	1	
	224.046-3-14	312		0.50	5	
	224.046-3-15	210		1.00	1	
	224.046-3-16.112	270		1.00	1	
	224.046-3-16.113	270		1.00	1	
	224.046-3-16.12	270		1.00	1	
	224.046-3-16.2	270		1.00	1	
	224.046-4-10.1	270		1.00	1	
	224.046-4-11	270		1.00	1	
	224.046-4-12	270		1.00	1	
	224.046-4-13	270		1.00	1	
	224.046-4-14	312		0.50	5	
	224.046-4-8	311		0.50	5	
Cherry Hill Road	223.036-1-10	210		1.00	1	
	223.036-1-11.11	210		1.00	1	
	223.036-1-11.11	210		1.00	1	
	223.036-1-13	210		1.00	1	
	223.036-1-14	210		1.00	1	
	223.036-1-15	210		1.00	1	
	223.036-1-3.1	210		1.00	1	
	223.036-1-6.1	312		0.50	5	

Town of Fine Existing Users

Road Name	Tax Map No.	Property Class Code	Description	EDU	Code	Notes
Cherry Hill Road (cont'd)	223.036-1-7	210		1.00	1	
	223.036-1-8	311		0.50	5	
	223.036-1-9	210		1.00	1	
	223.036-1-9	210		1.00	1	
Colby Road	224.037-3-10	210		1.00	1	
	224.037-3-10	210		1.00	1	
	224.037-3-11	210		1.00	1	
	224.037-3-16	311		0.50	5	
	224.037-3-17	312		0.50	5	
	224.037-3-18	210		1.00	1	
	224.037-3-4	311		0.50	5	
	224.037-3-5	210		1.00	1	
	224.037-3-6	210		1.00	1	
	224.037-3-8	311		0.50	5	
	224.037-3-9	210		1.00	1	
	224.045-1-21	311		0.50	5	
	224.045-1-22	311		0.50	5	
	224.045-1-23	311		0.50	5	
	224.045-1-24	210		1.00	1	
Colton Lane	224.045-1-27	312		0.50	5	
	224.038-1-25	210		1.00	1	
	224.038-1-26	210		1.00	1	
	224.038-1-27	210		1.00	1	
	224.038-1-28	210		1.00	1	
	224.038-1-29	210		1.00	1	
	224.038-1-30	210		1.00	1	
	224.038-3-1	270		1.00	1	
	224.038-3-2	210		1.00	1	
	224.038-3-3	210		1.00	1	
	224.038-3-4	210		1.00	1	
	224.038-3-5	210		1.00	1	
	224.038-3-6	210		1.00	1	
	224.038-3-7	210		1.00	1	
	224.038-1-32.2	311		0.50	5	
Forest Park Road	224.046-2-7.11	311		0.50	5	
	224.046-2-7.12	210		1.00	1	
	224.046-2-7.2	270		1.00	1	
Forest View Road	224.046-4-2	270		1.00	1	
	224.046-4-3	210		1.00	1	
	224.046-4-4	271		2.00	2	Two mobile homes
	224.046-4-5	270		1.00	1	
	224.046-4-6	311		0.50	5	
	224.046-5-11.1	270		1.00	1	
	224.046-5-12	270		1.00	1	
	224.046-5-13	270		1.00	1	
	224.046-5-14	311		0.50	5	
	224.046-5-15	311		0.50	5	
	224.046-5-16.1	210		1.00	1	
	224.046-5-19	311		0.50	5	
	224.046-5-20	210		1.00	1	
Gore Street	223.000-1-17.1	910		0.00	5	
	223.000-1-17.2	312		0.50	5	
	224.029-1-1	210		1.00	1	
	224.029-1-10.1	210		1.00	1	
	224.029-1-10.1	210		1.00	1	
	224.029-1-2	311		0.50	5	
	224.029-1-3	210		1.00	1	

Town of Fine Existing Users

Road Name	Tax Map No.	Property Class Code	Description	EDU	Code	Notes
Gore Street (cont'd)	224.029-1-4	612		0.05	4	vacant, unbuildable school lot
	224.029-1-9.1	210		1.00	1	
Gregg Street	224.037-4-2	210		1.00	1	
	224.045-1-4	210		1.00	1	
Griffin Avenue	224.045-1-5	311		0.50	5	
	224.038-3-13.1	312		0.50	5	
	224.038-3-15	210		1.00	1	
	224.038-3-16	312		0.50	5	
	224.038-3-17	311		0.50	5	
	224.038-3-18	311		0.50	5	
	224.038-3-19	210		1.00	1	
	224.038-3-20	210		1.00	1	
	224.038-3-21	210		1.00	1	
	224.038-3-22	210		1.00	1	
	224.038-3-23	210		1.00	1	
	224.038-3-24	210		1.00	1	
	224.038-3-25	311		0.50	5	
	224.038-3-26	311		0.50	5	
	224.038-3-27	311		0.50	5	
	224.038-3-30	210		1.00	1	
	224.038-3-31	210		1.00	1	
	224.038-3-32	210		1.00	1	
	224.038-3-33	210		1.00	1	
	224.038-3-34	210		1.00	1	
	224.038-3-35	210		1.00	1	
Hall Avenue	224.046-1-1	311		0.50	5	
	224.021-1-11	210		1.00	1	
	224.021-1-13	612		8.00	4	CF School - 582,333 is average annual usage
Inn Avenue	224.029-2-24	210		1.00	1	
	224.029-3-11	311		0.50	5	
	224.029-4-10	260		1.00	3	
	224.029-4-36	311		0.50	5	
	224.029-4-6	260		1.00	3	
	224.029-4-7	260		1.00	3	
	224.029-4-8	260		1.00	3	
	224.029-4-9	210		1.00	1	
	224.030-1-10	312		0.50	5	
	224.030-1-11	311		0.50	5	
	224.030-1-4.2	311		0.50	5	
	224.030-1-5	311		0.50	5	
Kenny Street	224.046-6-18	270		1.00	1	
	224.046-6-19.1	311		0.50	5	
	224.046-6-19.2	314		0.50	5	
	224.046-6-20	210		1.00	1	
	224.046-6-3	210		1.00	1	
Kerr	224.046-6-4	210		1.00	1	
	224.038-1-31.1	311		0.50	5	
	224.038-3-28	311		0.50	5	
Lake Road	223.000-1-21.11	931		0.05	5	unbuildable
	223.036-1-20	910		0.05	5	unbuildable
	223.036-2-1	260		1.00	3	
	223.036-2-17.1	210		1.00	1	
	223.036-2-19.1	260		1.00	3	
	223.036-2-2	210		1.00	1	
	223.036-2-20.1	210		1.00	1	
	223.036-2-20.1	210		1.00	1	
	224.000-10-1	931		0.05	5	unbuildable

Town of Fine Existing Users

Road Name	Tax Map No.	Property Class Code	Description	EDU	Code	Notes
Lake Road (cont'd)	224.038-1-33	910		0.05	5	unbuildable
	224.045-1-10	311		0.50	5	
	224.045-1-11	210		1.00	1	
	224.045-1-13	210		1.00	1	
	224.045-1-14	311		0.50	5	
	224.045-1-15.1	311		0.50	5	
	224.045-1-15.2	210		1.00	1	
	224.045-1-17	210		1.00	1	
	224.045-1-18	312		0.50	5	
	224.045-1-19	210		1.00	1	
	224.045-1-20	210		1.00	1	
	224.045-1-28.1	210		1.00	1	
	224.045-1-29.2	311		0.50	5	
	224.045-1-29.3	311		0.50	5	
	224.045-1-29.4	210		1.00	1	
	224.045-1-31	210		1.00	1	
	224.045-1-32	210		1.00	1	
	224.045-1-34	311		0.50	5	
	224.045-1-35	311		0.50	5	
	224.045-1-6	210		1.00	1	
	224.045-1-7	260		1.00	3	
	224.045-1-9.1	210		1.00	1	
	224.046-1-11	210		1.00	1	
	224.046-1-12	210		1.00	1	
	224.046-1-13	210		1.00	1	
	224.046-1-14	210		1.00	1	
	224.046-1-15	210		1.00	1	
	224.046-1-16	210		1.00	1	
	224.046-1-17	210		1.00	1	
	224.046-1-18	210		1.00	1	
	224.046-1-19	210		1.00	1	
	224.046-1-20.1	210		1.00	1	
	224.046-1-21	210		1.00	1	
	224.046-5-8	210		1.00	1	
	224.046-5-9	439		1.00	4	Seasonal repair shop
	224.046-6-1	312		0.50	5	
	224.046-6-2	210		1.00	1	
	224.046-6-21	210		1.00	1	
	224.046-6-5	311		0.50	5	
	224.046-6-7	210		1.00	1	
	224.046-6-8	311		0.50	5	
	224.046-6-9	210		1.00	1	
						Senior citizens housing, 24 one-bedroom apartments, laundromat and office building (1 person). 1/4 each for apartment and 1 for
Marshall Avenue	224.046-5-10	633		7.00	4	laundromat/office building
	224.030-3-10.1	210		1.00	1	
	224.030-3-11	210		1.00	1	Clifton residential: garage in fine, house in Clifton
	224.030-3-13	210		1.00	1	
	224.030-3-14	210		1.00	1	
	224.030-3-15	210		1.00	1	
	224.030-3-16.2	210		1.00	1	
	224.030-3-17.1	210		1.00	1	
	224.030-3-18.1	210		1.00	1	
	224.030-3-20	210		1.00	1	
	224.030-4-2	270		1.00	1	
	224.030-4-3	311		0.50	5	

Town of Fine Existing Users

Road Name	Tax Map No.	Property Class Code	Description	EDU	Code	Notes
Marshall Avenue (cont'd)	224.030-4-5	210		1.00	1	
	224.030-4-6	210		1.00	1	
	224.030-4-7	210		1.00	1	
	224.030-4-8	311		0.50	5	
	224.030-10-13	210		1.00	1	in Town of Clifton but served by Star Lake
Mohawk	224.046-4-7	270		1.00	1	
Oswegatchie Trail	223.028-2-1	210		1.00	1	
	223.028-2-3.1	210		1.00	1	
	223.028-2-4	270		1.00	1	
	223.028-2-5	210		1.00	1	
	223.028-2-6	210		1.00	1	
	223.036-1-12	311		0.50	5	
	223.036-1-16	210		1.00	1	
	223.036-1-2	641		7.50	4	Hospital - 560,467 is average annual usage
	223.036-1-4	311		0.50	5	
	223.036-1-5	210		1.00	1	
	223.036-2-22	311		0.50	5	
	223.036-2-3	620		1.00	4	
	223.036-2-3	620		1.00	4	
	223.036-2-4	312		0.50	5	
	223.036-2-5	210		1.00	1	
	223.036-2-6	260		1.00	3	
	223.036-2-7	210		1.00	1	
	223.036-2-8	210		1.00	1	
	224.029-1-5.1	314		0.50	5	
	224.029-1-5.2	312		0.50	5	
	224.029-1-5.3	260		1.00	3	
	224.029-1-5.4	260		1.00	3	
	224.029-1-5.5	260		1.00	3	
	224.029-1-5.6	260		1.00	3	
	224.029-1-5.7	260		1.00	3	
	224.029-1-5.8	260		1.00	3	
	224.029-1-6.1	311		0.50	5	
	224.029-1-6.2	260		1.00	3	Not currently served with water
	224.029-1-7	260		1.00	3	Not currently served with water
	224.029-2-20	210		1.00	1	
	224.029-2-21	210		1.00	1	
	224.029-2-22	260		1.00	3	
	224.029-2-23	311		0.50	5	
	224.029-2-23	311		0.50	5	
Pine Street	224.037-3-1.111	311		0.50	5	
	224.038-1-1	210		1.00	1	
	224.038-1-10	210		1.00	1	
	224.038-1-11	311		0.50	5	
	224.038-1-12	210		1.00	1	
	224.038-1-13	311		0.50	5	
	224.038-1-14	210		1.00	1	
	224.038-1-18	210		1.00	1	
	224.038-1-19	210		1.00	1	
	224.038-1-2	210		1.00	1	
	224.038-1-20.1	314		0.50	5	
	224.038-1-3.1	210		1.00	1	
	224.038-1-32.1	270		1.00	1	
	224.038-1-5	260		1.00	3	
	224.038-1-5	260		1.00	3	
	224.038-1-5	260		1.00	3	
	224.038-1-6	210		1.00	1	

Town of Fine Existing Users

Road Name	Tax Map No.	Property Class Code	Description	EDU	Code	Notes
Pine Street Cont'd	224.038-1-7	260		1.00	3	
	224.038-1-4.2	260		1.00	3	
Potter Avenue	224.029-3-12	210		1.00	1	
	224.029-3-13	260		1.00	3	
	224.029-3-14	260		1.00	3	
	224.029-3-15.11	210		1.00	1	
	224.029-3-16.1	311		0.50	5	
	224.029-3-8	210		1.00	1	
	224.029-4-1	312		0.50	5	
	224.029-4-2	210		1.00	1	
	224.029-4-3	311		0.50	5	
	224.029-4-35	311		0.50	5	
	224.029-4-37	260		1.00	3	
	224.029-4-4	312		0.50	5	
	224.029-4-5	260		1.00	3	
	224.030-1-12	210		1.00	1	
School Street	224.029-2-25	210		2.00	1	Sunmount House, approx. 150,000 gal/yr usage
Scotts Point Road	224.029-4-13	260		1.00	3	
	224.029-4-14	311		0.50	5	
	224.029-4-15	260		1.00	3	
	224.029-4-16	311		0.50	5	
	224.029-4-17	260		1.00	3	
	224.029-4-18	260		1.00	3	
	224.029-4-19.1	210		1.00	1	
	224.029-4-20.1	260		1.00	3	
	224.029-4-21	260		1.00	3	
	224.029-4-22	260		1.00	3	
	224.029-4-22	260		1.00	3	
	224.029-4-23	260		1.00	3	
	224.029-4-23	260		1.00	3	
	224.029-4-24	260		1.00	3	
	224.029-4-25.1	260		1.00	3	
	224.029-4-26.1	260		1.00	3	
	224.029-4-27	210		1.00	1	
	224.029-4-28	260		1.00	3	
	224.029-4-29	210		1.00	1	
	224.029-4-30	210		1.00	1	
	224.029-4-31.1	311		0.50	5	
	224.029-4-31.2	311		0.50	5	
	224.029-4-32	260		1.00	3	
	224.029-4-33	210		1.00	1	
	224.029-4-34	210		1.00	1	
	224.030-1-4.1	311		0.50	5	
	224.030-2-26	210		1.00	1	
	224.030-2-27	210		1.00	1	
	224.030-2-28	260		1.00	3	
	224.030-2-29	260		1.00	3	
	224.030-2-30	260		1.00	3	
	224.030-2-31	311		0.50	5	
	224.030-2-32	210		1.00	1	
	224.030-2-33	210		1.00	1	
	224.030-2-34	312		0.50	5	
	224.030-2-35	210		1.00	1	
	224.030-2-36	311		0.50	5	
	224.030-2-40	260		1.00	3	

Town of Fine Existing Users

Road Name	Tax Map No.	Property Class Code	Description	EDU	Code	Notes
State Highway 3	224.000-1-3.1	449		0.50	4	
	224.000-1-5	682		4.00	4	clubhouse 2 EDU and Arena 2 EDU
	224.000-1-6.11	330		0.50	5	
	224.021-1-1	330		0.50	5	
	224.021-1-10	270		1.00	1	
	224.021-1-12	311		0.50	5	
	224.021-1-14	464		1.00	4	
	224.021-1-2.1	620		1.00	4	
	224.021-1-2.2	484		1.00	4	
	224.021-1-3	330		0.50	5	
	224.021-1-4	423		1.00	4	
	224.021-1-5	652		1.00	4	
	224.021-1-7.1	461		1.00	4	
	224.021-1-8	210		1.00	1	
	224.021-1-9	210		1.00	1	
	224.029-2-1	210		1.00	1	
	224.029-2-10	831		0.50	4	
	224.029-2-11	311		0.50	5	
	224.029-2-12	311		0.50	5	
	224.029-2-13	210		1.00	1	
	224.029-2-14	210		2.00	1	house and apartment on property
	224.029-2-15	210		1.00	1	
	224.029-2-16	210		1.00	1	
	224.029-2-17	210		1.00	1	
	224.029-2-18	260		1.00	3	
	224.029-2-19	210		1.00	1	
	224.029-2-2	210		1.00	1	
	224.029-2-3	330		0.50	5	
	224.029-2-4	454		1.00	4	IGA
	224.029-2-5	311		0.50	5	
	224.029-2-6	421		1.70	4	Twin Lake: 123,970 average annual usage
	224.029-2-7	471		1.00	4	Funeral Home
	224.029-2-8	210		1.00	1	
	224.029-3-1	210		1.00	1	
	224.029-3-10.1	210		1.00	1	
	224.029-3-17	210		1.00	1	
	224.029-3-2	484		1.00	4	
	224.029-3-3.1	210		1.00	1	
	224.029-3-4.1	449		0.50	4	
	224.029-3-5.1	210		1.00	1	
	224.029-3-9	210		1.00	1	
	224.029-3-9	210		1.00	1	
	224.030-1-1	662		1.00	4	Fire department
	224.030-1-2	682		1.00	4	
	224.030-1-3	449		0.50	4	
	224.030-1-6	311		0.50	5	
	224.030-1-7	480		1.00	4	
	224.030-1-8	331		0.50	5	
	224.030-1-9	330		0.50	5	
	224.030-2-1	210		1.00	1	
	224.030-2-2	210		1.00	1	
	224.030-2-20	260		1.00	3	
	224.030-2-21	822		0.00	4	
	224.030-2-22	311		0.50	5	
	224.030-2-23	652		1.00	4	Town office building
	224.030-2-24	210		1.00	1	
	224.030-2-25.1	312		0.50	5	

Town of Fine Existing Users

Road Name	Tax Map No.	Property Class Code	Description	EDU	Code	Notes
State Highway 3 (cont'd)	224.030-2-3	210		1.00	1	
	224.030-2-39	330		0.50	5	
	224.030-2-4.1	460		0.50	4	Small real estate office (no water)
	224.030-2-4.2	210		1.00	1	
	224.030-2-5	312		0.50	5	
	224.030-2-6	210		1.00	1	
	224.030-2-7	210		1.00	1	
	224.030-2-8	330		0.50	5	
	224.030-2-9	483		1.00	4	
	224.030-3-1	210		1.00	1	
	224.030-3-2	311		0.50	5	
	224.030-3-23.1	486		4.20	4	Nice -n- Easy: 308,393 is average annual usage
	224.030-3-24	411		4.00	4	Four apartments
	224.030-3-25	484		1.00	4	
	224.030-3-26	483		1.00	4	
	224.030-3-27	471		1.00	4	Funeral Home
	224.030-3-28	311		0.50	5	
	224.030-3-29	220		2.00	2	
	224.030-3-3	210		1.00	1	
	224.030-3-30.11	210		1.00	1	
	224.030-3-30.12	210		1.00	1	
	224.030-3-30.2	311		0.50	5	
	224.030-3-4	210		1.00	1	
	224.030-3-5	311		0.50	5	
	224.030-3-6	311		0.50	5	
	224.030-3-8	438		0.50	4	
	224.030-3-9	210		1.00	1	
	224.030-10-10	210		1.00	1	in Town of Clifton but served by Star Lake
Shelton Crest Road	224.030-4-15	311		0.50	5	
	224.030-4-25	210		1.00	1	
Swiss Point Road	223.036-2-10	210		1.00	1	
	223.036-2-10	210		1.00	1	
	223.036-2-11	311		0.50	5	
	223.036-2-11	311		0.50	5	
	223.036-2-12.1	311		0.50	5	
	223.036-2-12.2	210		1.00	1	
	223.036-2-13.1	311		0.50	5	
	223.036-2-13.2	210		1.00	1	
	223.036-2-14	210		1.00	1	
	223.036-2-15	260		1.00	3	
Valley View Road	223.036-2-9	210		1.00	1	
	224.046-3-1	210		1.00	1	
	224.046-3-12	270		1.00	1	
	224.046-3-18	270		1.00	1	
	224.046-3-2	311		0.50	5	
	224.046-3-3	270		1.00	1	
	224.046-3-4	270		1.00	1	
	224.046-3-5	311		0.50	5	
	224.046-3-6	270		1.00	1	
	224.046-3-7	311		0.50	5	
	224.046-3-8	270		1.00	1	
	224.046-3-9	312		0.50	5	
	224.046-4-1	210		1.00	1	
	224.046-4-15	210		1.00	1	
	224.046-5-1	312		0.50	5	

Town of Fine Existing Users

Road Name	Tax Map No.	Property Class Code	Description	EDU	Code	Notes
Webb Avenue	224.046-6-12	311		0.50	5	
	224.046-6-13	311		0.50	5	
	224.046-6-6	311		0.50	5	
Youngs Road	224.030-2-10	210		1.00	1	
	224.030-2-11	210		1.00	1	
	224.030-2-12	210		1.00	1	
	224.030-2-13	210		1.00	1	
	224.030-2-14	210		1.00	1	
	224.030-2-15	210		1.00	1	
	224.030-2-16.1	311		0.50	5	
	224.030-2-17.1	270		1.00	1	
	224.030-2-18	210		1.00	1	
	224.030-2-19	311		0.50	5	
	224.030-2-38	480		1.25	4	apartment and 1 office use water, 1 office no water
	224.030-3-21	620		1.00	4	
	224.030-4-1	210		1.00	1	
	224.030-4-21	330		0.50	5	
	224.030-4-22	210		1.00	1	
	224.030-4-23	271		0.50	2	vacant, abandoned trailers
	224.030-4-24	312		0.50	5	
	224.038-1-15	210		1.00	1	
	224.038-1-16	210		1.00	1	
	224.038-1-17	210		1.00	1	
	224.038-1-20.2	311		0.50	5	
	224.038-1-21.1	311		0.50	5	
	224.038-1-21.2	210		1.00	1	
	224.038-1-22	210		1.00	1	
	224.038-1-23	210		1.00	1	
	224.038-1-24	210		1.00	1	
	224.038-2-10	311		0.50	5	
	224.038-2-11	210		1.00	1	
	224.038-2-12	210		1.00	1	
	224.038-2-13	210		1.00	1	
	224.038-2-14	210		1.00	1	
	224.038-2-15	210		1.00	1	
	224.038-2-16	210		1.00	1	
	224.038-2-17	210		1.00	1	
	224.038-2-18	311		0.50	5	
	224.038-2-19	311		0.50	5	
	224.038-2-20	210		1.00	1	
	224.038-2-21	311		0.50	5	
	224.038-2-22	210		1.00	1	
	224.038-2-24	270		1.00	1	
	224.038-2-4	210		1.00	1	
	224.038-2-5.1	311		0.50	5	
	224.038-2-7	210		1.00	1	
	224.038-2-8	210		1.00	1	
	224.038-2-9	311		0.50	5	
	224.038-3-10	220		2.00	2	
	224.038-3-11	210		1.00	1	
	224.038-3-12	210		1.00	1	
	224.038-3-29	311		0.50	5	
	224.038-3-8	210		1.00	1	
	224.038-3-9	210		1.00	1	
	224.046-1-10	210		1.00	1	
	224.046-2-2	210		1.00	1	
	224.046-2-3	210		1.00	1	

Town of Fine Existing Users

Road Name	Tax Map No.	Property Class Code	Description	EDU	Code	Notes
Youngs Road (cont'd)	224.046-2-4	210		1.00	1	
	224.046-2-5	210		1.00	1	
	224.046-2-6	210		1.00	1	
	224.046-2-8.2	210		1.00	1	
	224.046-3-16.111	311		0.50	5	
	224.046-3-17.1	270		1.00	1	
TOTAL EXISTING				466.9		
Single family residential (1)				278.00	EDUs	
Multi-family residential (2)				6.50	EDUs	
Seasonal residential (3)				50.00	EDUs	
Commercial (4)				63.70	EDUs	
Vacant (5)				68.70	EDUs	
TOTAL EXISTING				466.9		
TOTAL EXISTING O&M EDUS				398.2		

Town of Fine New Users

Road Name	Tax Map No.	Property Class Code	Description	EDU	Code	Notes
Hanks Road	223.044-1-11	311		0.50	5	
Lake Street	223.036-3-1.1	311		0.50	5	
	223.044-1-1.12	311		0.50	5	
	223.044-1-1.2	311		0.50	5	
	223.044-1-12	210		1.00	1	
	223.044-1-13	210		1.00	1	
	223.044-1-14	210		1.00	1	
	223.044-1-15	260		1.00	3	
	223.044-1-16	210		1.00	1	
	223.044-1-17	210		1.00	1	
	223.044-1-18	260		1.00	3	
	223.044-1-19	210		1.00	1	
	223.044-1-2	260		1.00	3	
	223.044-1-21	311		0.50	5	
	223.044-1-3	311		0.50	5	
	223.044-1-4.1	210		1.00	1	
	224.037-5-2	210		1.00	1	
	224.037-6-10	260		1.00	3	
	224.037-6-6	260		1.00	3	
	224.037-6-7	260		1.00	3	
	224.037-6-8	260		1.00	3	
	224.037-6-9	260		1.00	3	
	224.045-1-2.2	311		0.50	5	
	224.045-2-2	311		0.50	5	
Pine Street	224.037-3-1.112	312		0.50	5	Currently inside Star Lake WD but not served
	224.037-3-1.12	210		1.00	1	Currently inside Star Lake WD but not served
	224.037-3-15	210		1.00	1	Currently inside Star Lake WD but not served
	224.037-3-2.11	311		0.50	5	Currently inside Star Lake WD but not served
	224.037-3-2.12	210		1.00	1	Currently inside Star Lake WD but not served
TOTAL NEW				24.0		
Single family residential (1)				11.00		
Multi-family residential (2)				0.00		
Seasonal residential (3)				8.00		
Commercial (4)				0.00		
Vacant (5)				5.00		
TOTAL NEW				24.0		
TOTAL NEW O&M EDUS				19.0		

Exhibit 3

Manufacturer's Data

Harmsco Cartridge Filtration

HARMSCO[®] MUNICIPAL

Filtration Systems



Meet your EPA LT2 requirements today

Harmsco's Cost-effective Solutions for LT2 Compliance

What is Long Term 2 Enhanced Surface Water Treatment Rule (LT2 Rule)?

The EPA has developed the LT2 ESWTR (LT2 Rule) to improve your drinking water quality and provide additional protection from disease-causing microorganisms and contaminants.

Why is the EPA concerned about *Cryptosporidium*?

Cryptosporidium is a significant concern in drinking water because it contaminates most drinking water sources, it is resistant to chlorine and other disinfectants, and has caused waterborne disease outbreaks. Consuming water with ***Cryptosporidium*** can cause gastrointestinal illness which may be severe and sometimes fatal for people with weakened immune systems including infants and the elderly. The EPA estimates that full compliance with LT2 ESWTR will reduce the incidence of cryptosporidiosis by 89,000 to 1,459,000 cases per year, with an associated reduction of 20 to 314 premature deaths.

Who does this rule apply to?

The LT2 ESWTR applies to all public water systems that use surface water, or ground water under the direct influence of surface water. This includes about 14,000 systems serving approximately 180 million people.

LT2 ESWTR Toolbox Manual (April, 2010)

- ▶ All components used in drinking water treatment process should be evaluated for contaminant leaching and Certified under **ANSI/NSF Standard 61**.
- ▶ The **filter housing and cartridge** must be challenge tested per **LT2 ESWTR Toolbox Guidance Manual** with specific instructions regarding:
 - Full scale filter testing, challenge particulate, test solution concentration, challenge test duration, water quality of test solution, maximum design flow rate, challenge particulate seeding method and concentration, sampling procedures and calculation of log removal.
- ▶ Testing is product specific, not site specific, meaning it does not have to be tested at every water system seeking removal credit. Instead, a manufacturer or independent third party would challenge test each of its products in order to obtain a 2.0- or 2.5-log *Cryptosporidium* removal rating:
 - Up to 2.0-log removal for individual cartridge filters showing a minimum of 3.0-log removal in challenge testing.
 - Up to 2.5-log removal for cartridge filters in series showing a minimum of 3.0-log removal in challenge testing.
- ▶ A minimum of two (2) bag or cartridge filter housings should be provided to ensure continuous water treatment in the event of failure in the filter operation and to allow for filter maintenance and replacement.

Harmsco® LT2 Cartridges for Cyst-free Drinking Water

Harmsco® LT2 cartridges and housings exceed the three-log (99.9%) removal requirement described in LT2 ESWTR Toolbox Guidance Manual 8.4.1. for cyst-sized particles. For this reason, Harmsco® LT2 filter cartridge elements are ideal to control cryptosporidium, giardia cysts and other harmful microorganisms to help ensure safe drinking water.

Independent Lab Validated

To verify the performance of the Harmsco® LT2 cartridge and NSF filter housing, Pace/IBR, highly respected independent testing facilities, were selected to conduct challenge tests as outlined in the LT2 ESWTR Toolbox Guidance Manual 8.4.1. This defines the maximum challenge particulate based on detection limit and acceptable cryptosporidium surrogate...2 microns in these tests. The “terminal” pressure drop was determined by Harmsco® to be 30 psi. The Harmsco® LT2 cartridges were tested via single pass protocol per the EPA at 3 separate points: 1.) after initial flushing (clean cartridge), 2.) at 50% of terminal pressure drop (15 psid) and 3.) after terminal pressure loss has been reached (30 psid).

Results of Challenge Test Conducted by IBR

Cartridge Tested	Filter Housing	Tested Flow Rate	Sample Point	Minimum Log Removal
HC/170-LT2	MUNI-1-2FL-304	100 GPM	Initial Efficiency	3.6
			50% Terminal Pressure Drop: 15 psi	3.8
			100% Terminal Pressure Drop: 30 psi	3.7

Features & Benefits

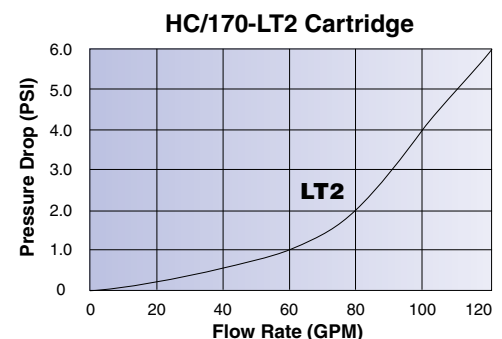
- ▶ NSF-61 Listed cartridge filter system removes cyst-sized particles providing safe drinking water
- ▶ Pleated microfiber media provides exceptional surface area for longer filter life and increased particle removal
- ▶ Patented Dual Durometer end caps ensure positive end cap sealing
- ▶ End caps, center tubes and media are thermally bonded as one integral component for added strength while providing superior sealing
- ▶ 120 sq. ft. media (surface area) in a single cartridge design
- ▶ FDA Listed Materials: Manufactured from materials which are listed for food contact applications in Title 21 of the U.S. Code of Federal Regulations



LT2 Cartridge
Length and O.D.

Low Pressure Drop

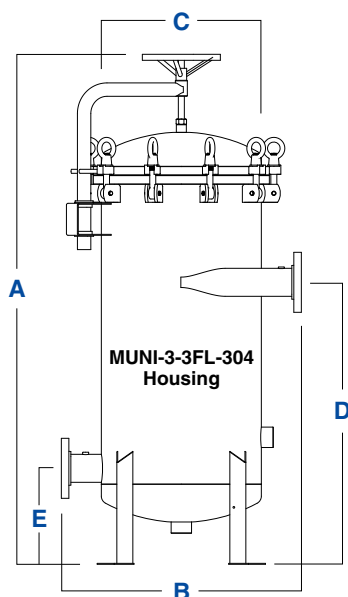
Initial pressure drop using HC/170-LT2 cartridges is exceptionally low due to our pleated design and increased surface area. Pressure drop data is shown below, calculated for new cartridges in clear water.



Specifications

- ▶ **Filter Media:** FDA borosilicate microglass with acrylic binder
- ▶ **Support Media:** spun-bonded polyester laminated on both upstream and downstream sides
- ▶ **Center Tubes:** rigid PVC with perforations
- ▶ **End Caps:** plastisol (pliable PVC)
- ▶ **Heat-seal Bags:** standard on HC/170-LT2 cartridge
- ▶ **Flow Rate:** 100 GPM (recommended) per HC/170-LT2 cartridge; > 3.6 Log removal
- ▶ **Temperature:** 140°F (60°C) max*
* Temperature limits vary and depend on pressure and time under load.
- ▶ **Maximum Change Out:** 30 PSI (2.07 Bar) ΔP
- ▶ **Surface Area:** 120 sq. ft. (HC/170-LT2)
- ▶ **Dimensions:** 7-3/4" O.D.; 4" I.D.; 30-3/4" L.
- ▶ **pH:** 3 to 11

HARMSCO® MUNICIPAL Filtration Systems



Certified: NSF/ANSI Standard 61
Drinking Water System Components -
Health Effects



Filter Model	A Filter Height	B Width	C Diameter	D Inlet	E Outlet	Pipe Size I/O NPS	Drain Size NPT	Floor Space	Service Height	Shipping Wt. (lbs.)
MUNI-1-2FL-304	48"	15-1/2"	11"	23-5/8"	9-3/4"	2" Flange	3/4"	1.6 ft ²	77"	150
MUNI-3-3FL-304	64"	30"	20"	35-1/4"	12"	3" Flange	1-1/2"	4.5 ft ²	98-1/2"	420
MUNI-5-4FL-304	74"	37-1/2"	30"	38"	14-1/8"	4" Flange	1-1/2"	8.5 ft ²	98-1/2"	1,100
MUNI-8-6FL-304	84"	45-1/4"	35-3/8"	44-1/4"	20-1/2"	6" Flange	1-1/2"	14 ft ²	104-1/2"	1,600

Design Recommendations

Pre-filtration is always recommended due to potential changes in environmental conditions. Turbidity must not exceed 1-NTU prior to final filtration stage (HC/170-LT2 cartridge). For more information please contact Harmsco Filtration Products.

Pre-Filtration

Filter Model	NO. of Cartridges	Pleated Media Area (sq. ft.)	Max Flow Rate (GPM)	Max Flow Rate (LPM)	Max Flow Rate (M ³ /HR)
MUNI-1-2FL-304	1	170	150	568	34
MUNI-3-3FL-304	3	510	450	1,703	102
MUNI-5-4FL-304	5	850	750	2,839	170
MUNI-8-6FL-304	8	1,360	1,200	4,542	272

Final Stage

Filter Model	NO. of Cartridges	Pleated Media Area (sq. ft.)	Max Flow Rate (GPM)	Max Flow Rate (LPM)	Max Flow Rate (M ³ /HR)
MUNI-1-2FL-304	1	120	100	378	23
MUNI-3-3FL-304	3	360	300	1,135	68
MUNI-5-4FL-304	5	600	500	1,892	113
MUNI-8-6FL-304	8	960	800	3,028	181

Filter Specifications

- ▶ 304L or 316L stainless steel, electropolished
- ▶ Built to ASME design standards (not code stamped)
- ▶ Standpipe - 304L or 316L stainless steel
- ▶ Inlet/Outlet - flanged connections
- ▶ NSF 61 Listed Ball Valves (2) - 316 stainless steel
- ▶ O-ring housing seal, swing bolt closure
- ▶ NSF 61 Listed Pressure Gauges (2) - 316 stainless steel
- ▶ Pressure - 150 psi (10 bar) max.
- ▶ Temperature* - up to 140°F (60°C) with standard cartridges

* Temperature ratings based on pressure and time under load.

Note: This publication is to be used as a guide. The data within has been obtained from many sources and is considered to be accurate. Harmsco does not assume liability for the accuracy and/or completeness of this data. Changes to the data can be made without notification. Temperature, Pressure, Flow Rates, Differential Pressures, Chemical Combinations and other unknown factors can affect performance in unknown ways. **Limited Warranty:** Harmsco warrants their products to be free of material and workmanship defects. Determination of suitability of Harmsco products for uses and applications contemplated by Buyer shall be the sole responsibility of Buyer. The end user/installer/buyer shall be liable for the product's performance and suitability regarding their specific intended applications. End users should perform their own tests to determine suitability for each application.

HARMSCO® MUNICIPAL Filtration Systems

www.harmsco.com

P.O. Box 14066, North Palm Beach, FL 33408

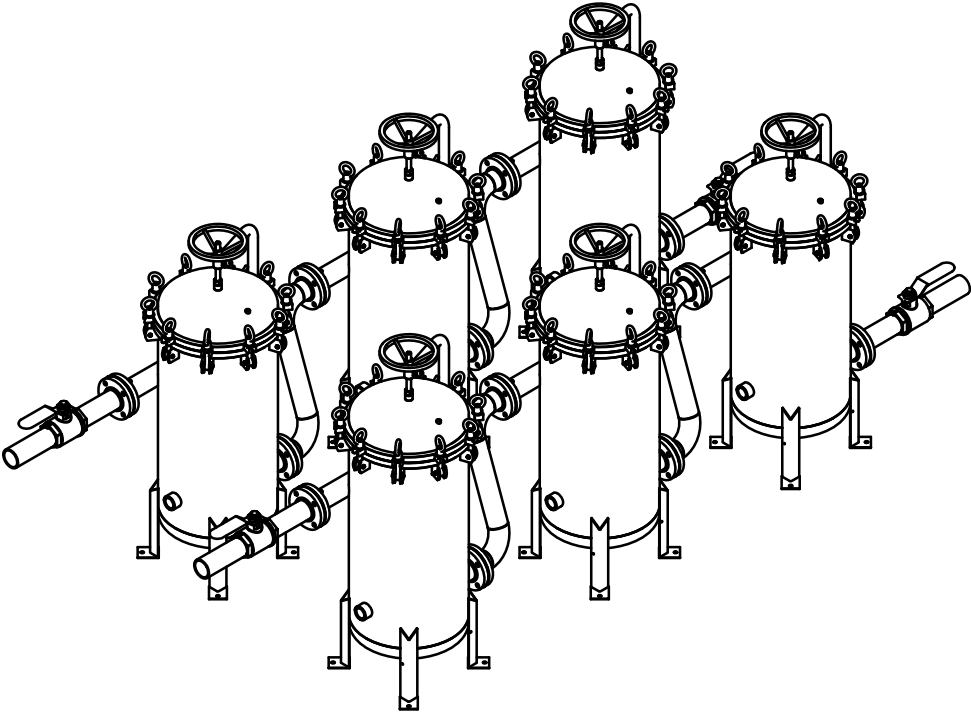
(561) 848-9628 • Toll-free: (800) 327-3248 • Fax: (561) 845-2474 • E-mail: sales@harmsco.com



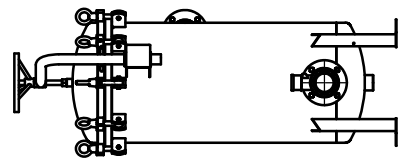
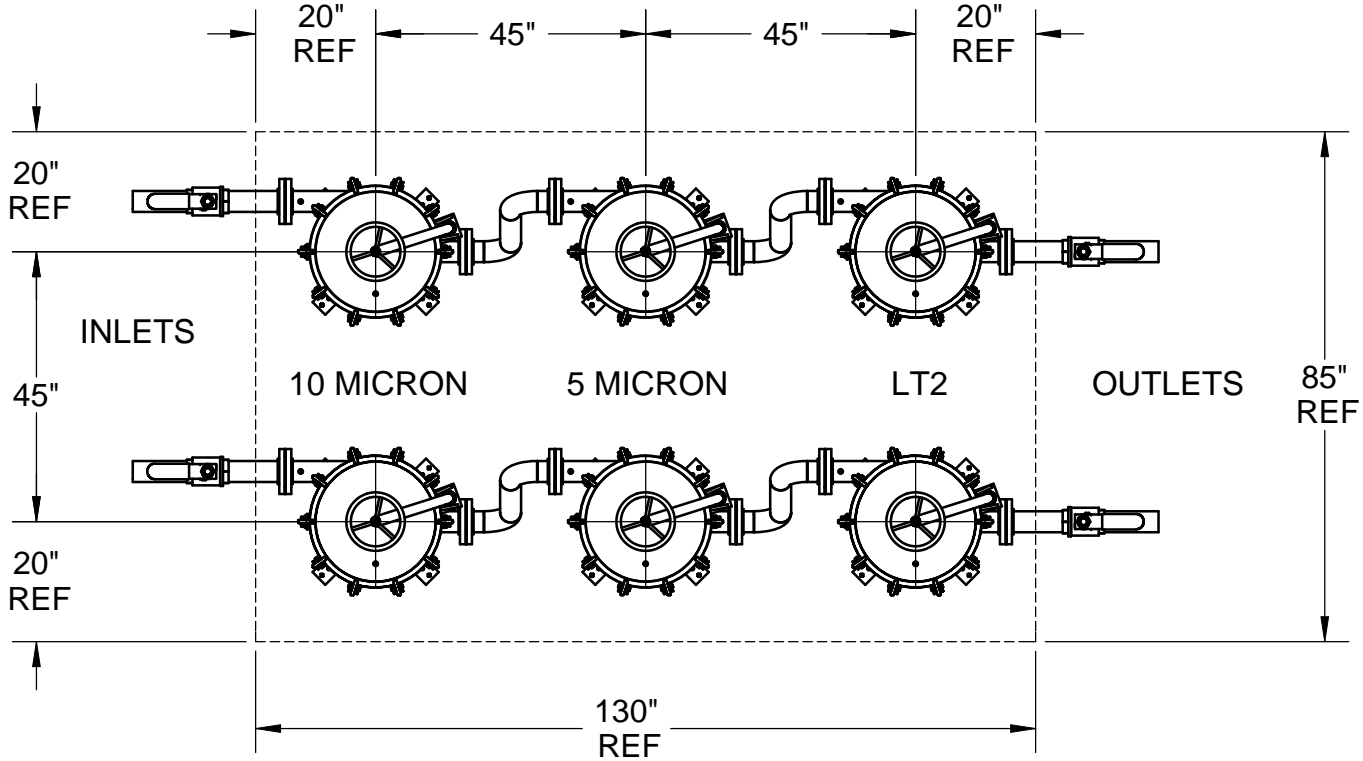
Made in USA

© Harmsco, Inc. 80A MUNI 19 8/12

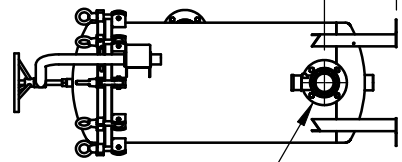
REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED



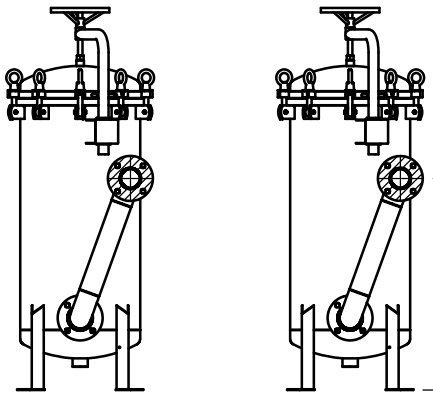
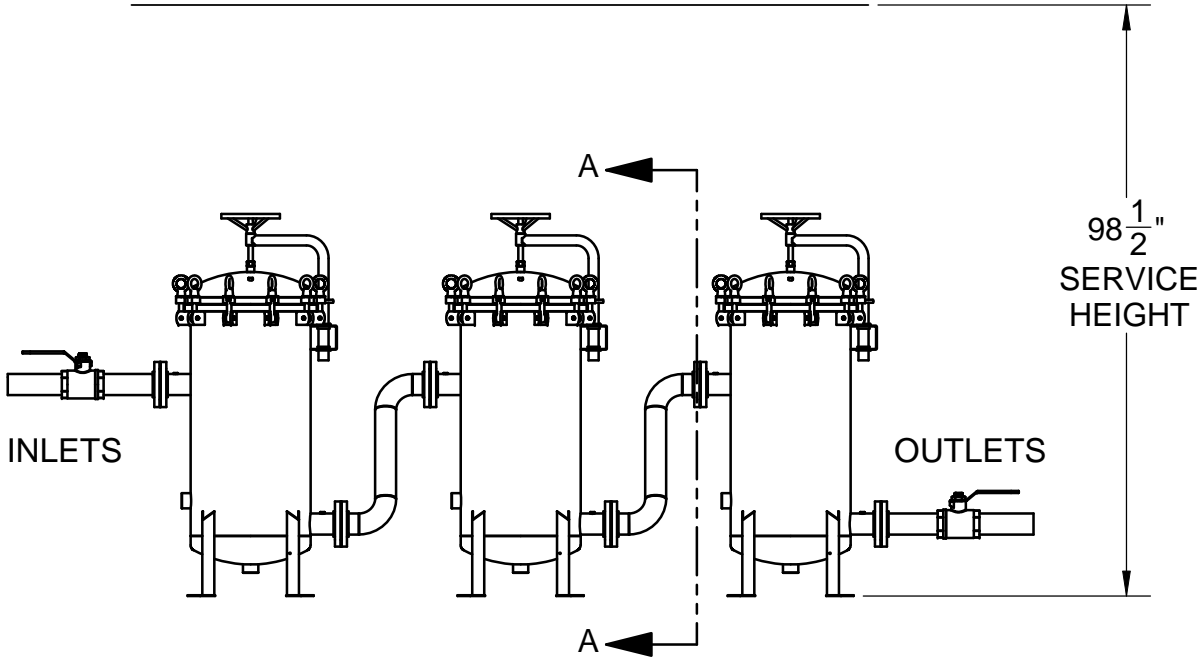
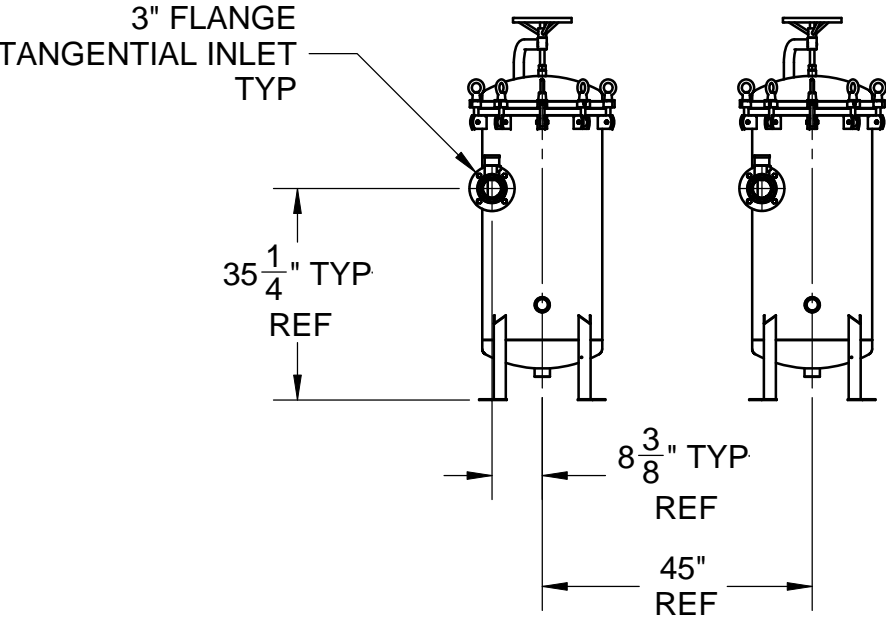
ISOMETRIC VIEW



12" TYP REF



3" FLANGE
OUTLET
TYP



35 1/4" TYP
REF

SECTION A-A

APPROVALS		DATE
DRAWN	RS	6-27-12
APPROVED		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		
FRACTIONS	DECIMALS	ANGLES
+/- 1/32	+/- .010	+/- 30'
DRAWN ON CAD DO NOT SCALE		

HARMSCO INC. P.O. BOX 14066 N. PALM BEACH, FL		
SCALE "1:32"	3 STAGE DUAL PATH SYSTEM MUNI-3-3FL, QTY 6	PART NO. N/A



To: Christian Lawton
Barton & Loguidice

From: James Kasprick
Harmsco

Project: Star Lake Filtration

Date: March 6, 2013

Harmsco is recommending a three-stage system that consists of six vessels based on a 300 GPM flow rate with an estimated 5 NTU water quality. Below is a description of each stage.

Stage 1 – Pre-filter Housings

A Particle Distribution Analysis is needed to determine application suitability

Qty (2) MUNI-3-3FL-304 Municipal Hurricane® Filtration Systems as follows:

- NSF-61 listed, certified for public drinking water
- Built to ASME design standards
- Filter housing includes built in cyclone separator to separate dense solids prior to cartridge element giving you two filters in one
- Patented Up-Flow Technology prevents accumulation of air inside filter housing eliminating the need for air vents while keeping the filter operating at 100%
- 304 stainless steel housing and internals, electro polished inside and out for extended filter housing life (*316 stainless steel and coated options available*)
- Flow rates up to 300 GPM (*Pre-Filter Stages up to 450 GPM*)
- Each filter housing accepts (3) HC/170 series cartridges
- Total surface area per housing 510 sq. ft. (*based on Harmsco Premium Series pleated*)
- Extensive choice of cartridge micron ratings and medias
- Inlet & Outlet connections - 3" Flanges ANSI/ASME B16.5 Class 150
- Two (2) 316 SS NSF 61 ¾" FNPT Drain Valves
- Two (2) 316 SS NSF 61 Inlet and outlet pressure gauges, 0-150 PSIG
- ¼" FNPT lid vent
- Filter housing weighs 420 lbs.
- Lift Davit swing bolt closure system with EPDM O-ring seal
- Pressure rated to 150 PSIG
- Temperature rated to 250° F (*housing only*)



Stage 1 - 10 Micron Pre-Filter Cartridges for Housings

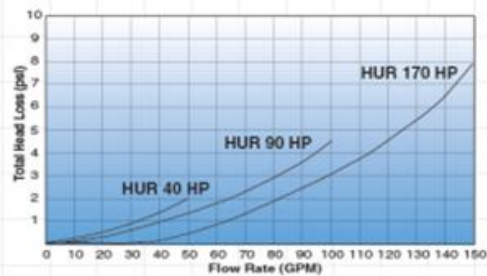
A Particle Distribution Analysis is needed to determine application suitability

Qty (6) HC/170-5 Hurricane High Performance Filter Cartridge as follows:

- NSF-61 listed certified for public drinking water
- Nominally rated at 10 microns
- Pleated Polyester-Plus® filter media for high flow rates and lower initial pressure drop
- Cleanable and reusable (*5 micron and above in most applications*)
- Each cartridge contains 170 square feet of pleated media providing exceptional surface area, higher loading capacity for longer filter life and increased particulate removal
- End cap, center tube and media are thermally bonded as one integral component for added strength
- Pliable PVC end caps with sealing surface built in
- Center tubes of ABS or PVC
- Temperature rating of 140° F (*temperature limits may vary based on time under load, pressure differential and process fluids chemical composition*)

Pressure Drop

Pressure drop shown at right is for filter housing and 20 micron filter cartridge in clean water.





Stage 2 – Pre-filter Housings

A Particle Distribution Analysis is needed to determine application suitability

Qty (2) MUNI-3-3FL-304 Municipal Hurricane® Filtration Systems as follows:

- NSF-61 listed, certified for public drinking water
- Built to ASME design standards
- Filter housing includes built in cyclone separator to separate dense solids prior to cartridge element giving you two filters in one
- Patented Up-Flow Technology prevents accumulation of air inside filter housing eliminating the need for air vents while keeping the filter operating at 100%
- 304 stainless steel housing and internals, electro polished inside and out for extended filter housing life (*316 stainless steel and coated options available*)
- Flow rates up to 300 GPM (*Pre-Filter Stages up to 450 GPM*)
- Each filter housing accepts (3) HC/170 series cartridge
- Total surface area per housing 510 sq. ft. (*based on Harmsco Premium Series pleated*)
- Extensive choice of cartridge micron ratings and medias
- Inlet & Outlet connections - 3" Flanges ANSI/ASME B16.5 Class 150
- Two (2) 316 SS NSF 61 ¾" FNPT Drain Valves
- Two (2) 316 SS NSF 61 Inlet and outlet pressure gauges, 0-150 PSIG
- ¼" FNPT lid vent
- Filter housing weighs 420 lbs.
- Lift Davit swing bolt closure system with EPDM O-ring seal
- Pressure rated to 150 PSIG
- Temperature rated to 250° F (*housing only*)



Stage 2 - 5 Micron Pre-Filter Cartridges

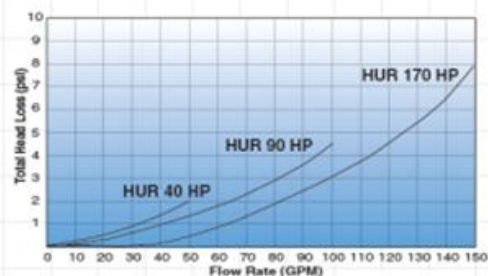
A Particle Distribution Analysis is needed to determine application suitability

Qty (6) HC/170-5 Hurricane High Performance Filter Cartridge as follows:

- NSF-61 listed certified for public drinking water
- Nominally rated at 5 microns
- Pleated Polyester-Plus® filter media for high flow rates and lower initial pressure drop
- Cleanable and reusable (*5 micron and above in most applications*)
- Each cartridge contains 170 square feet of pleated media providing exceptional surface area, higher loading capacity for longer filter life and increased particulate removal
- End cap, center tube and media are thermally bonded as one integral component for added strength
- Pliable PVC end caps with sealing surface built in
- Center tubes of ABS or PVC
- Temperature rating of 140° F (*temperature limits may vary based on time under load, pressure differential and process fluids chemical composition*)

Pressure Drop

Pressure drop shown at right is for filter housing and 20 micron filter cartridge in clean water.





Stage 3 - Final Filter Housings

A Particle Distribution Analysis is needed to determine application suitability

Qty (2) MUNI-3-3FL-304 Municipal Hurricane® Filtration Systems as follows:

- NSF-61 listed, certified for public drinking water
- Built to ASME design standards
- Filter housing includes built in cyclone separator to separate dense solids prior to cartridge element giving you two filters in one
- Patented Up-Flow Technology prevents accumulation of air inside filter housing eliminating the need for air vents while keeping the filter operating at 100%
- 304 stainless steel housing and internals, electro polished inside and out for extended filter housing life (*316 stainless steel and coated options available*)
- Flow rates up to 300 GPM (*maximum based on LT2 guidelines*)
- Each filter housing accepts (3) HC/170 series cartridge
- Total surface area per housing 360 sq. ft. (*based on Harmsco Premium Series pleated*)
- Extensive choice of cartridge micron ratings and medias
- Inlet & Outlet connections - 3" Flanges ANSI/ASME B16.5 Class 150
- Two (2) 316 SS NSF 61 ¾" FNPT Drain Valves
- Two (2) 316 SS NSF 61 Inlet and outlet pressure gauges, 0-150 PSIG
- ¼" FNPT lid vent
- Filter housing weighs 420 lbs.
- Lift Davit swing bolt closure system with EPDM O-ring seal
- Pressure rated to 150 PSIG
- Temperature rated to 250° F (*housing only*)



Stage 3 - Final Filter Cartridges Model LT2

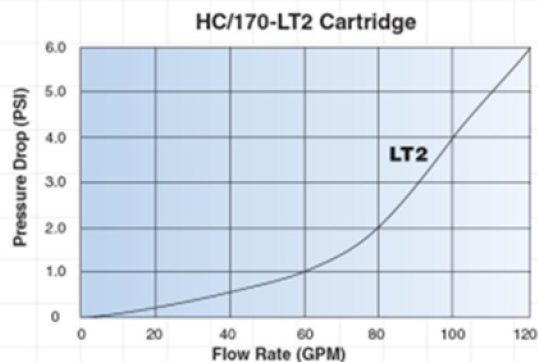
A Particle Distribution Analysis is needed to determine application suitability

Qty (6) HC/170-LT2 Hurricane Absolute Rated Filter Cartridges as follows:

- Cartridge filter is NSF-61 Listed, certified for public drinking water with Independent lab validation to LT2 Drinking Water Standards
- Substantially Reduces: Cryptosporidium, Giardia cysts, Harmful organisms, Sediment, Silt, and Turbidity
- Flow rates up to 100 GPM per cartridge (*maximum based on LT2 guidelines*)
- Each cartridge contains 120 square feet of pleated media providing exceptional surface area, higher loading capacity for longer filter life and increased particulate removal
- Filter media: FDA borosilicate Micro fiberglass with acrylic binder, support media – spun bonded polyester laminated on both upstream and downstream sides.
- End cap, center tube and media are thermally bonded as one integral component for added strength
- Pliable PVC end caps with sealing surface built in
- Center tubes of rigid perforated PVC or molded polypropylene
- Temperature rating of 140° F (temperature limits may vary based on time under load, pressure differential and process fluids chemical composition)
- Cartridge length – 30-3/4", cartridge O.D – 7-3/4" and cartridge I.D 3"
- Packaged one (1) per box

Low Pressure Drop

Initial pressure drop using HC/170-LT2 cartridges is exceptionally low due to our pleated design and increased surface area. Pressure drop data is shown below, calculated for new cartridges in clear water.



LT2 End Cap

Genuine Harmsco® NSF Listed LT2 cartridges come standard with patented dual durometer end caps to ensure positive sealing.

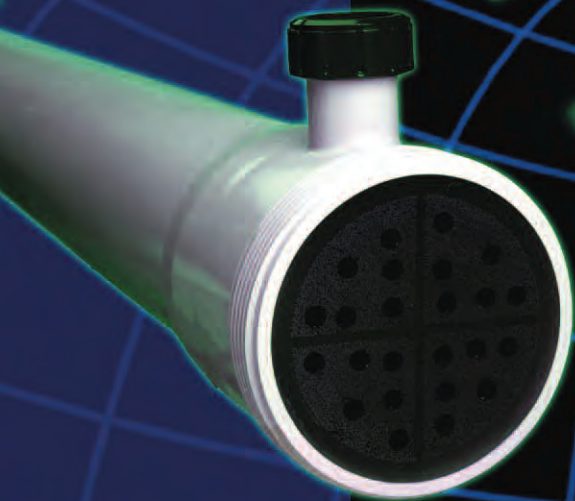
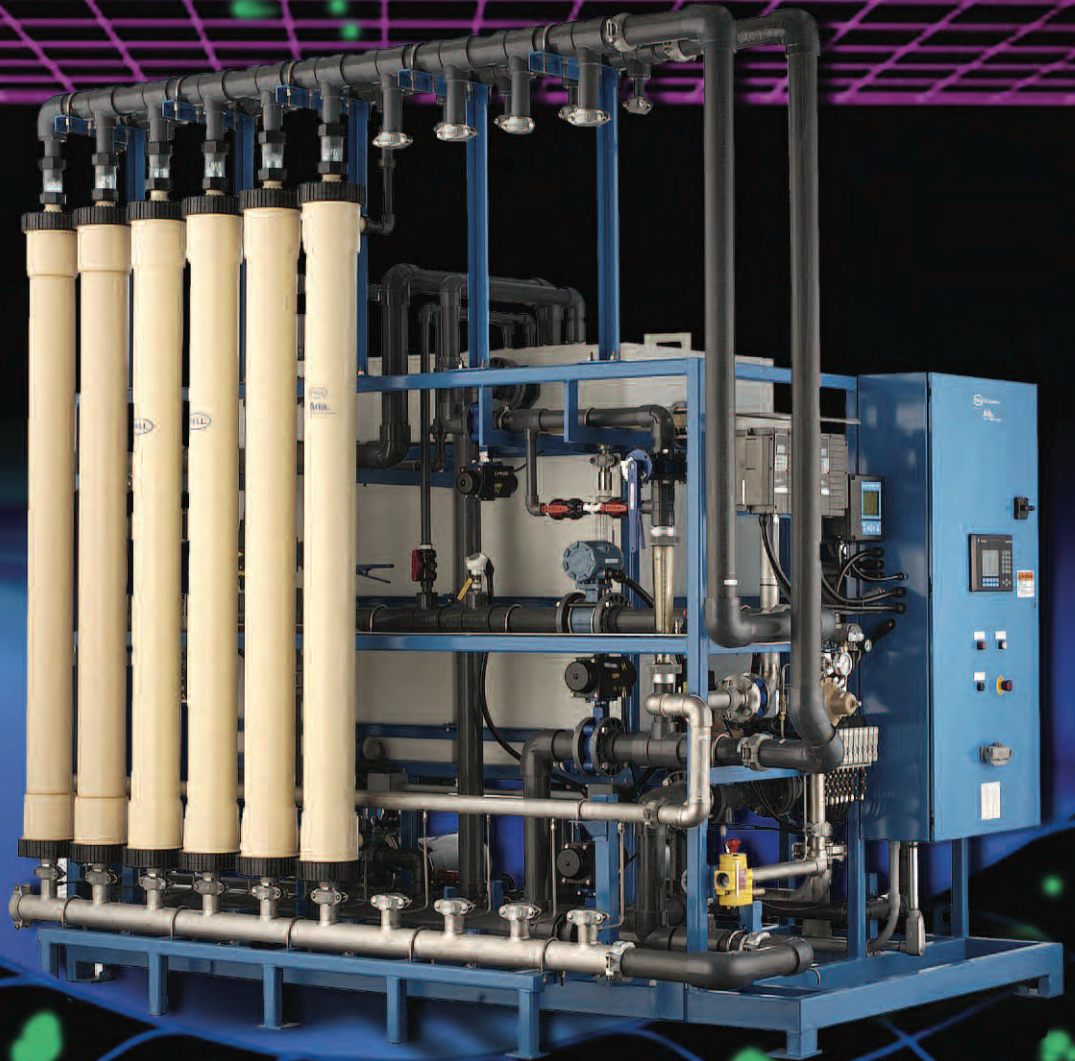


Pall Membrane Filtration



Pall Corporation

Pall Aria™
AP Series
Packaged
Water
Treatment
Systems



Filtration. Separation. Solution.™

Pall Aria™ AP Series Packaged Water Treatment Systems

Installations

Point Hope, AK

Wainwright, AK

Nuiqsut, AK

Point Lay, AK

Atkasuk, AK

Anchorage, AK

Kaktuvik, AK

Kernville, CA

Burbank, CA

Membrane Filtration for Safe Drinking Water

Pall Aria™ AP water treatment systems are specifically designed to produce drinking water that meets today's stringent standards. The systems use uniquely designed filtration modules in a hollow fiber configuration to remove the following contaminants from surface and ground water sources.

- Suspended solids/turbidity
- Viruses
- Bacteria
- Cysts and oocysts
- Iron and manganese
- Arsenic
- Organics

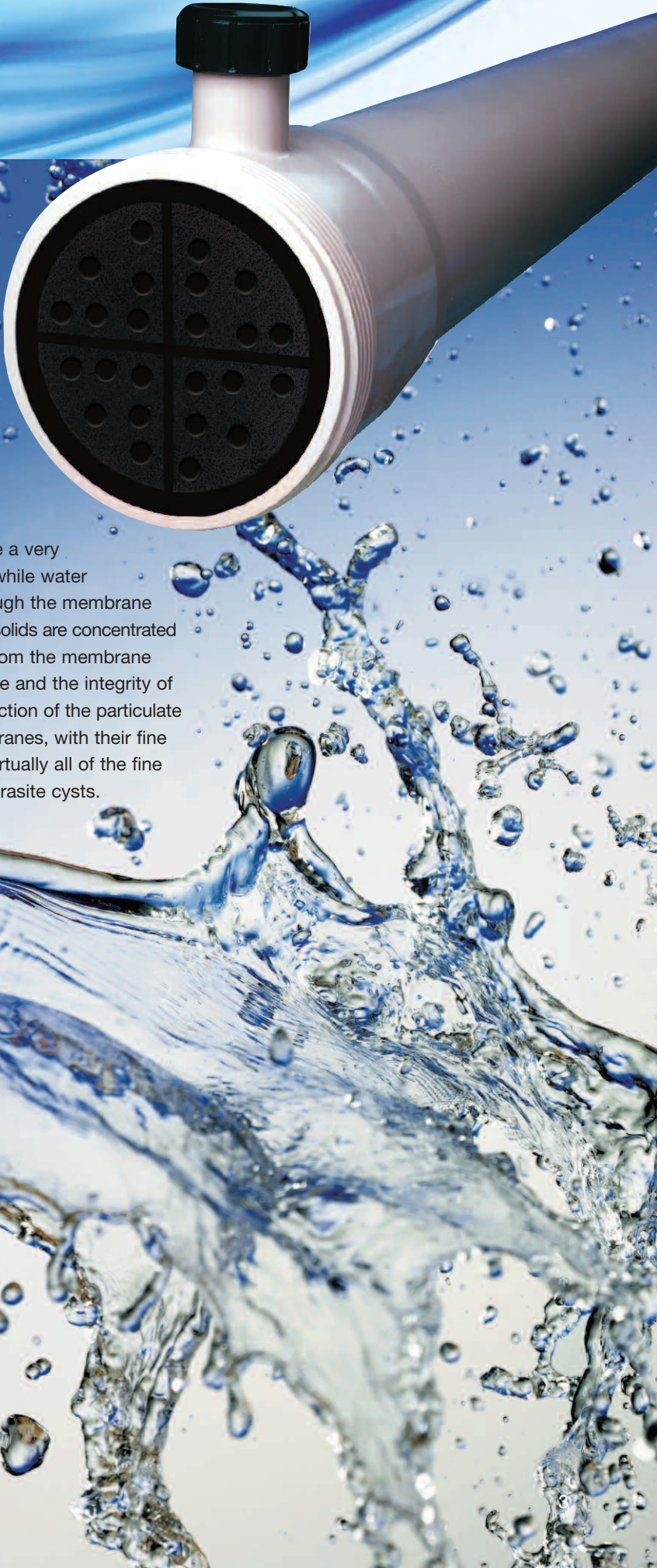
The Microza¹ hollow fiber membranes are highly permeable, resulting in high water production rates. Each hollow fiber module provides high active surface area of up to 538 ft². Pall's dedication to a simplified process and control design has produced a family of systems that are characterized by:

- Tough, hollow fiber membranes with long service life
- Operator-friendly controls
- Simple surface water treatment without coagulation
- Unique air scrub and flush operation
- High efficiency and low waste
- Excellent compatibility with chlorine and common treatment chemicals
- Minimal cost of operation
- Easy installation using modular skids
- Compact system footprint
- Full system NSF 61 listing
- ISO 9001 certified manufacturing
- ETV certified for surface water treatment rule

Site testing confirmed Pall Aria AP systems meet or exceed US EPA standards for safe drinking water. The system is also the first to receive 'full system' certification in accordance with ANSI/NSF 61 specifications.

¹ Microza is a registered trademark of Asahi Kasei Corp., Ltd.





Membrane filtration is a pressure driven process that uses a semipermeable (porous) membrane to separate particulate matter from soluble components in the carrier fluid, such as water. In Pall Aria AP systems, microfiltration or ultrafiltration membranes act much like a very fine sieve to retain particulate matter, while water and its soluble components pass through the membrane as filtrate, or filtered water. The retained solids are concentrated in a waste stream that is discharged from the membrane system. The pore size of the membrane and the integrity of the sealing mechanism controls the fraction of the particulate matter that is removed. Microza membranes, with their fine pore size and absolute seal, remove virtually all of the fine matter, such as silica, bacteria, and parasite cysts.



Pall Aria AP Systems - Overview

Installations

Forestville, CA

Avon, CO

Pinellas Park, FL

Hobart, NY

Youngs River, OR

Beverly Beach Park, OR

Bullards Beach, OR

Astoria, OR

Hite Marina, UT

Transforming Water from Any Source to Match Your Requirements

Pall Aria AP water treatment systems are used to filter ground and surface waters for drinking water supply and industrial uses, and secondary wastewater effluent for reuse.

Ground Water

- Lowers turbidity and removes microbial pathogens from ground water under the influence of surface water.
- Removes iron and manganese with oxidation.
- Removes arsenic with coagulation.

Surface Water

- Lowers turbidity and removes microbial pathogens from raw water drawn from rivers, streams, lakes, and reservoirs.
- Removes organics with coagulation to improve disinfection by-products rule compliance, taste, and odor.

Secondary Wastewater Effluent

- Removes suspended solids and reduces SDI prior to RO treatment for reuse.
- Removes bacteria and other pathogens and suspended solids to produce water suitable for landscape irrigation and similar reuse applications.

Pall Membrane Microbial and Particulate Removal

Contaminants	Typical Removal ²	
	Microfiltration (MF)	Ultrafiltration (UF)
Giardia	>6 log	>6 log
Cryptosporidium	>6 log	>6 log
MS2 Coliphage or bacteriophage	0.5 – 2.5 log ³	4.5 – 6 log ³
Turbidity	<0.1 ntu	<0.1 ntu

² Based on third party testing.

³ Virus removal varies depending on coagulation process upstream of system.



Pall Aria AP Systems - Specifications

Packaged for Fast, Easy Installation

Pall Aria AP water treatment systems are highly flexible production-scale membrane filtration packages, designed to filter a wide range of feed streams. Standard systems are available in the following skid-mounted configurations.

Standard System Specifications

Model Number	Maximum Number of Modules	Filtered Water Capacity (gpm [m ³ /hr])	Dimensions (L x W x H : ft [m])	
			Shipped ⁴	Installed
AP-1	2	3-25 [0.7-5.7]	6.1 x 2.8 x 6.5 [1.9 x 0.9 x 2.0]	6 x 2.8 x 9.8 ⁷
AP-2	8	10-50 [2.3-11.4]	8.1 x 2.8 x 6.5 [2.5 x 0.9 x 2.0]	8 x 4.1 x 9.9 ⁷
AP-3	10	25-150 [5.7-34.1]	8.2 x 5.7 x 7.5 [2.5 x 1.7 x 2.3]	9.5 x 6.9 x 10.3 ⁷
AP-3x	20	25-150 [5.7-34.1]	8.2 x 5.7 x 7.5 [2.5 x 1.7 x 2.3] ^{5, 6}	8.8 x 18.6 x 10.8 ⁵
AP-4	36	50-350 [11.4-79.5]	10 x 6.8 x 7.7 [3 x 2.1 x 2.3] ^{5, 6}	10.8 x 20.8 x 10.8 ⁵
AP-6	60	200-850 [45.4-193.2]	10 x 6 x 6.8 [3 x 1.8 x 2.1] ^{5, 6, 8}	19.1 x 17 x 10.8 ^{5, 8}

⁴ Crating: Add 0.5 ft [0.15 m] to each dimension. ⁷ Control skid with attached module rack.

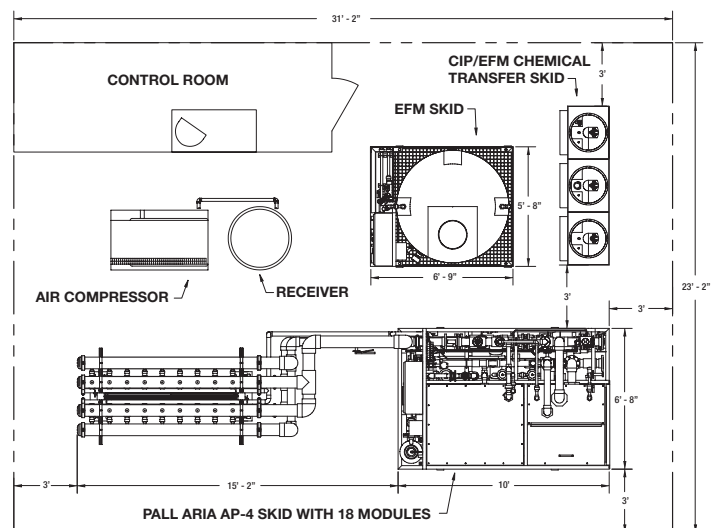
⁵ Module rack is off the skid.

⁶ Module rack shipped as crated parts kit.

⁸ Two freestanding tanks 5'6" W x 7'6" H, shipped separately for each skid.

Optional and Auxiliary Equipment

- Modem for remote access
- Auto dialer for alarms
- PC for operator interface terminal and data acquisition
- Feed or filtrate turbidimeters
- Oxidant dosing systems
- Air compressor systems
- Enhanced Flux Maintenance (EFM) systems to reduce system costs
- Disinfectant dosing systems
- Coagulant and clean-in-place (CIP) chemical
- Storage dosing systems
- Filtrate particle counter



Typical treatment plant layout for 500,000 gallons per day

Auxiliary equipment to improve treatment capabilities is available on separate skids, which are equipped with distributed controls that can be integrated into a master control system to provide optimal, automatic integrated system operation.

Installations

Basalt, UT

Lake Powell UT

Stoney Creek, VA

Ashford, WA

Meeteetse, WY

Point of Rocks, WY

Manati, Puerto Rico

Burleigh Falls, Canada

Bruce Mines, Canada

Panel Ray, Mexico

Standard Components

A standard Pall Aria AP packaged system consists of 1 to 60 membrane modules, one feed/CIP tank and pump, one reverse filtration tank and pump, manual and automatic valves, flow meter, pressure and temperature sensors, PLC control, control panel, and a painted carbon steel frame. Other items can be added on request. Separate auxiliary skids are available for compressed air and chemical feed/pre-oxidation.

- Painted carbon steel frame
- 316 SST pumps with TEFC motors and VFDs
- PVC and stainless steel piping
- Butterfly valves (manual and air operated)
- PE tanks with level control
- PLC controls and software
- Instrumentation (digital and 4-20 ma analog signal)
- NEMA-4 electrical enclosures

Operating Conditions

- Maximum inlet pressure: 3 bar (44 psi)
- Maximum operating temperature: 40°C (104°F)
- Minimum operating temperature: 1°C (33°F)

Utility Requirements

Electrical Connection

AP 1:	1 ph	230v	50 A
AP 2:	1 ph	230v	30 A or
	3 ph	230v	25 A or
	3 ph	460v	15 A
AP 3/3x:	3 ph	230v	40 A or
	3 ph	460v	25 A
AP 4:	3 ph	460v	40 A
AP 6:	3 ph	460v	70 A

Other voltage can be accommodated, if required. Water supply for CIP: 25-35°C (75-95°F)



Module cutaway showing hollow fibers

Microza Hollow Fiber Microfiltration Module⁹

- Membrane material: PVDF
- Pore rating: 0.1 micron (μm)
- Fiber OD/ID: 1.3 mm/0.7 mm
- Active filter area: 538 ft²
- Module size: 6" diameter x 79" long
- Housing: ABS
- Gasket: EPDM
- Potting material: Urethane

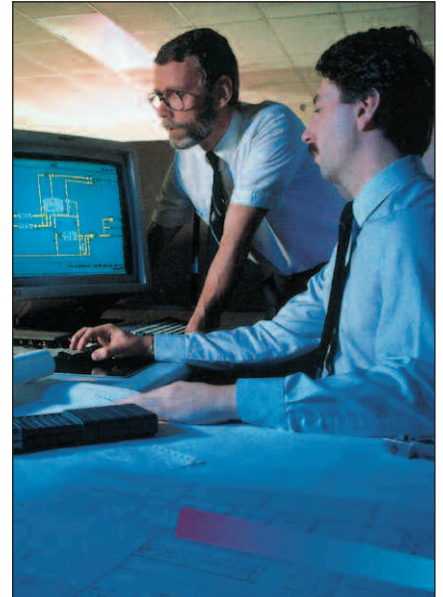
⁹ Ultrafilters also available

NSF System Listing

Pall's family of hollow fiber membrane systems were the first "full systems" to be listed in accordance with ANSI/NSF 61 specifications. The Pall Aria AP system is manufactured from NSF-approved materials and meets all requirements for potable water service.

ISO 9000 Certification

Pall's North American manufacturing, engineering, sales, and marketing operations have received ISO 9001 registration from Lloyd's Register of Quality Assurance Limited. ISO 9001, which also covers design and development functions, represents the highest, most comprehensive level of ISO 9000 certification. The quality system and procedures are regularly audited to assure compliance and proper record keeping before the certification is renewed.



Pall R&D team members

Pall Aria AP Systems - Operations

Clean Water, Clean System

Filtration (Normal Production)

Feed water enters the bottom of the module and is distributed uniformly to the outside of the fibers. Since it is under pressure, the water passes through the hollow fiber membranes, and filtered water exits through the top of the module. Under normal conditions, all of the feed water flows through the membranes and exits as filtered water. Depending on the feed quality, a small amount of the feed water may be circulated past the outside of the hollow fibers. This flow prevents the accumulation of foulants and debris on the surface of the membrane and helps to evenly distribute flow through the membrane fibers.

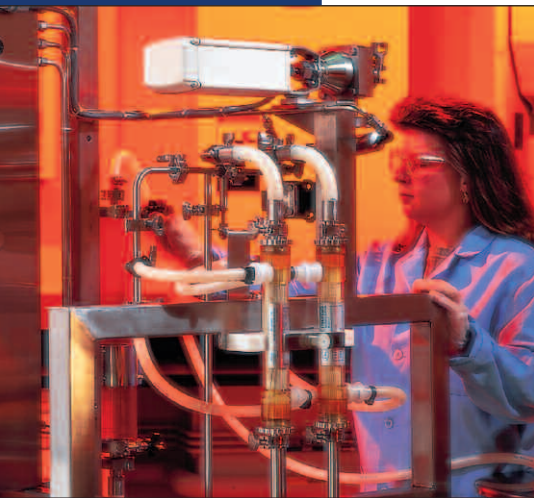
Flux Maintenance (FM)

As water is filtered, rejected particulate accumulates in the module on the surface of the membrane fiber. The effect is a flow restriction in the module, resulting in an increase in transmembrane pressure (TMP). FM is a two-step process, consisting of simultaneous air scrubbing (AS) and reverse filtration (RF), followed by flushing with feed or filtered water. This is a mechanical process to remove the debris from the module and reduce the rate of overall increase in transmembrane pressure.

Flux maintenance is initiated at a preset interval of water throughput or, as a secondary trigger, by a preset time interval. The air valve opens and air is injected at low pressure into the feed side of the module. At the same time, filtered water that has been collected in the RF tank is pumped in the reverse direction through the module and out through the main system drain. Air and RF flow are then stopped. At this point, most, if not all, accumulated debris in the module has been swept to drain.

To complete the cycle, a flush is performed by circulating feed or filtrate, depending on raw water quality, at high velocity from the feed/RF tank along the outside and then the inside of the membrane fibers. This last flow of liquid is directed through the excess recirculation port of the module to drain. This further dislodges and removes debris from the module that was captured by the membrane fibers.

Pall Aria AP systems perform this fully automated cycle every 20 - 120 minutes, interrupting forward flow for about 1.5 - 2 minutes.



Enhanced Flux Maintenance (EFM)

To ensure maximum efficiency and lowest total cost of ownership, Pall developed an enhanced cleaning technique to keep the membranes free of fouling materials. EFM is a fully automated process that uses water with mild chemical solutions to significantly reduce TMP. A reduction in TMP decreases pumping energy and results in fewer modules, which in turn scales down the system footprint and lowers facility heating and cooling costs.

The highly crystalline polyvinylidene fluoride (PVDF) hollow fiber membranes that are part of every Pall Aria AP system make EFM possible. These fibers are exceptionally strong and chemically resistant, with a life of 10+ years, even with daily EFM. When changes in water conditions make EFM unnecessary, the on-board control system disables it, increasing efficiency of the Pall Aria AP system.



Chemical Clean-in-Place (CIP)

Backwash and EFM are designed to remove particulate matter and foulants. In most applications, it will occasionally be necessary to execute a complete CIP process. The CIP process is a two-step protocol using a caustic solution with chlorine and an acidic solution. This process will return the modules to nearly new condition and can be performed hundreds of times over the life of the modules.

Since CIP operation is infrequent, the process is semi-automated. The cleaning and rinse cycles are programmed for manual initiation and require minimal operator intervention.



Pall Aria AP-4 System



Pretreatment Requirements

Pall Aria AP water treatment systems provide reliable, low maintenance performance. A 400 μm strainer is included on the feed water line to prevent debris from clogging small passages in the system.

Enclosures

A heated structure is required where freezing temperatures are expected. A roof may be required in other areas to prevent damage from sunlight and high temperatures.

A pre-engineered metal, concrete, or wood frame building is acceptable and can be designed to address many aesthetic concerns.

Seismic Design

The skid can be modified for use in Seismic Zone 4 areas (highest hazard). An anchoring plan will be furnished upon request.

CIP Conditions

Pall recommends that all chemicals for treatment and CIP be purchased in solution form. Water for CIP should be heated to 31-38°C (90-100°F).

Contact Pall to obtain the recommended CIP procedures and specifications for chemicals.

Wastewater Disposal

The FM wastewater and CIP and EFM wastes can be discharged to a sanitary sewer, if available. In areas without sanitary sewers, the FM wastewater can be discharged to a settling pond to remove suspended solids.

The clarified supernatant may be discharged to a local receiving stream or recycled to the plant feed water. Pilot testing may be required before recycling the supernatant. If sanitary sewers are unavailable, CIP and EFM wastes should be combined and neutralized prior to collection and disposal by a waste hauler. These wastes can be disposed of like septic system sludge. The customer is responsible for contacting the local regulatory agencies and obtaining the appropriate permits and approvals before initiating any discharge of process wastewater.

Contact Us for Support or Information

Remote online monitoring of system performance by Pall water specialists and membrane maintenance contracts are available from Pall. Contact your local Pall representative or Pall Corporation to obtain more information.





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Filtration. Separation. Solution.SM

WP-300e

Produced in the USA

August 2011

Exhibit 4

FEMA Flood Zone Mapping

CORPORATE LIMITS

PENNSYLVANIA

STAR LAKE RD

ZONE C

3

DORAN RD

HENDERSON TRAIL

CENTRAL

R.R.

LITTLE RIVER

(PRIVATE RD)

ZONE C

ZONE A

ZONE C

ZONE A

SUNNY POND

3

ROUTE 50

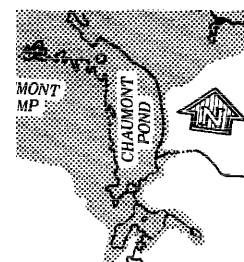


federal emergency management agency

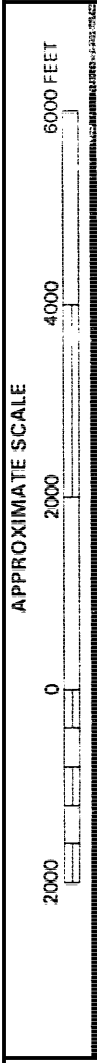
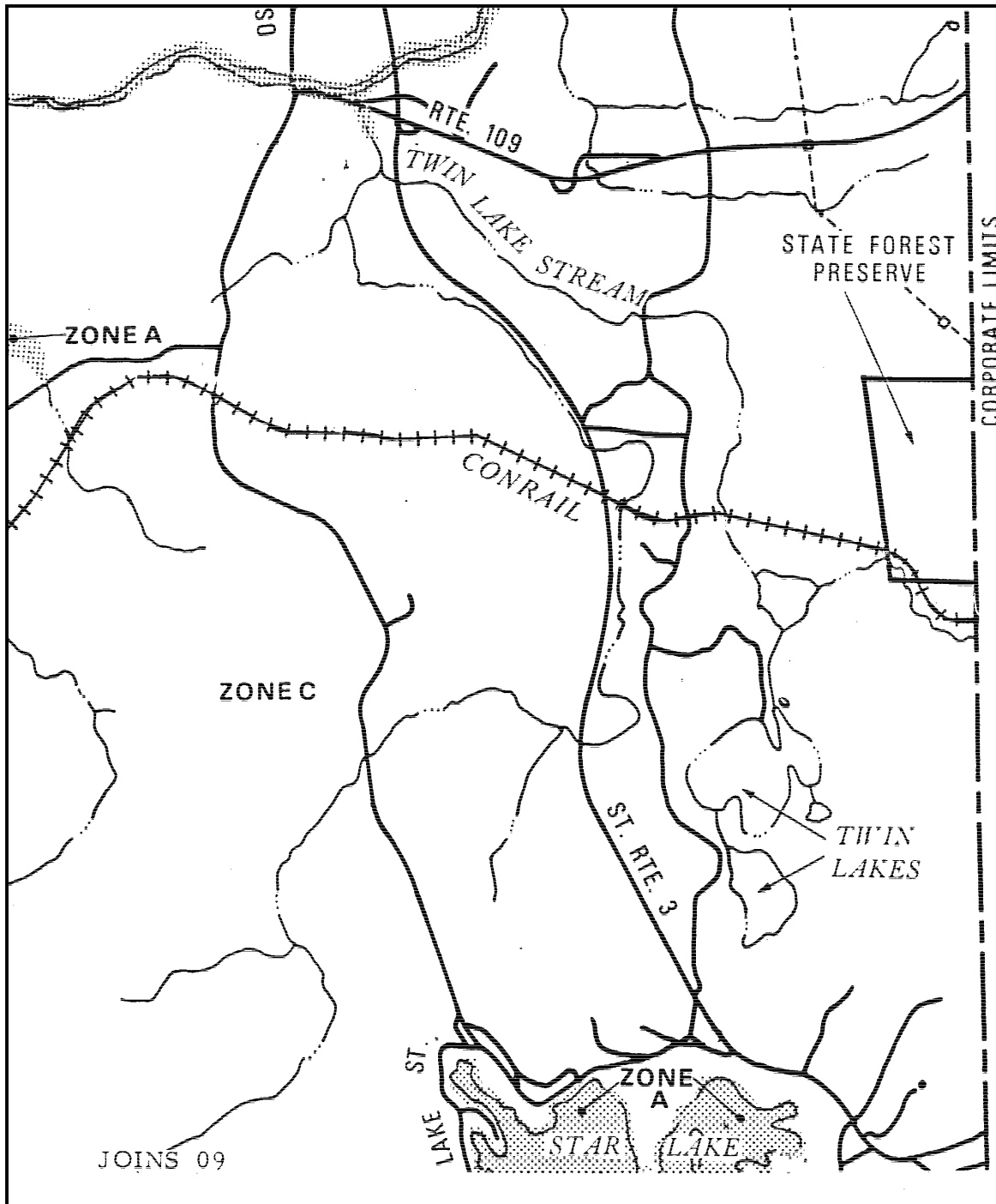
TOWN OF CLIFTON, NY

ST. LAWRENCE COUNTY

EFFECTIVE DATE
MAY 15, 1986



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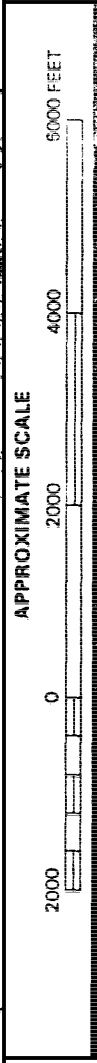
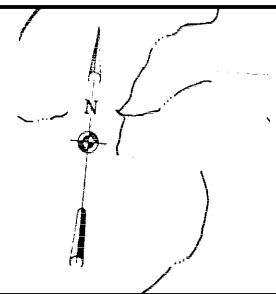
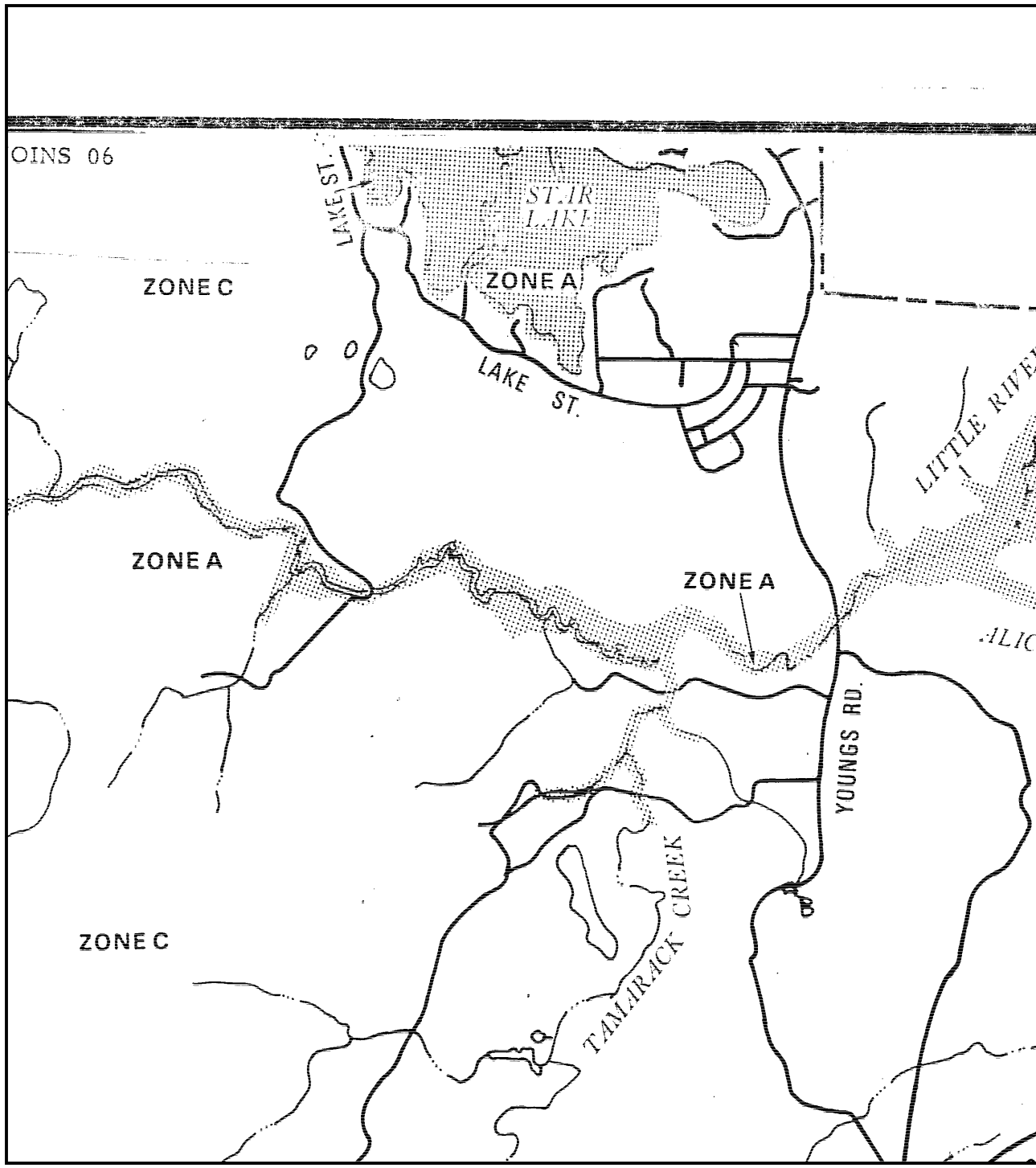
federal emergency management agency

TOWN OF FINE, NY

ST. LAWRENCE COUNTY

EFFECTIVE DATE
MAY 1, 1985

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federal emergency management agency

TOWN OF FINE, NY **ST. LAWRENCE COUNTY**

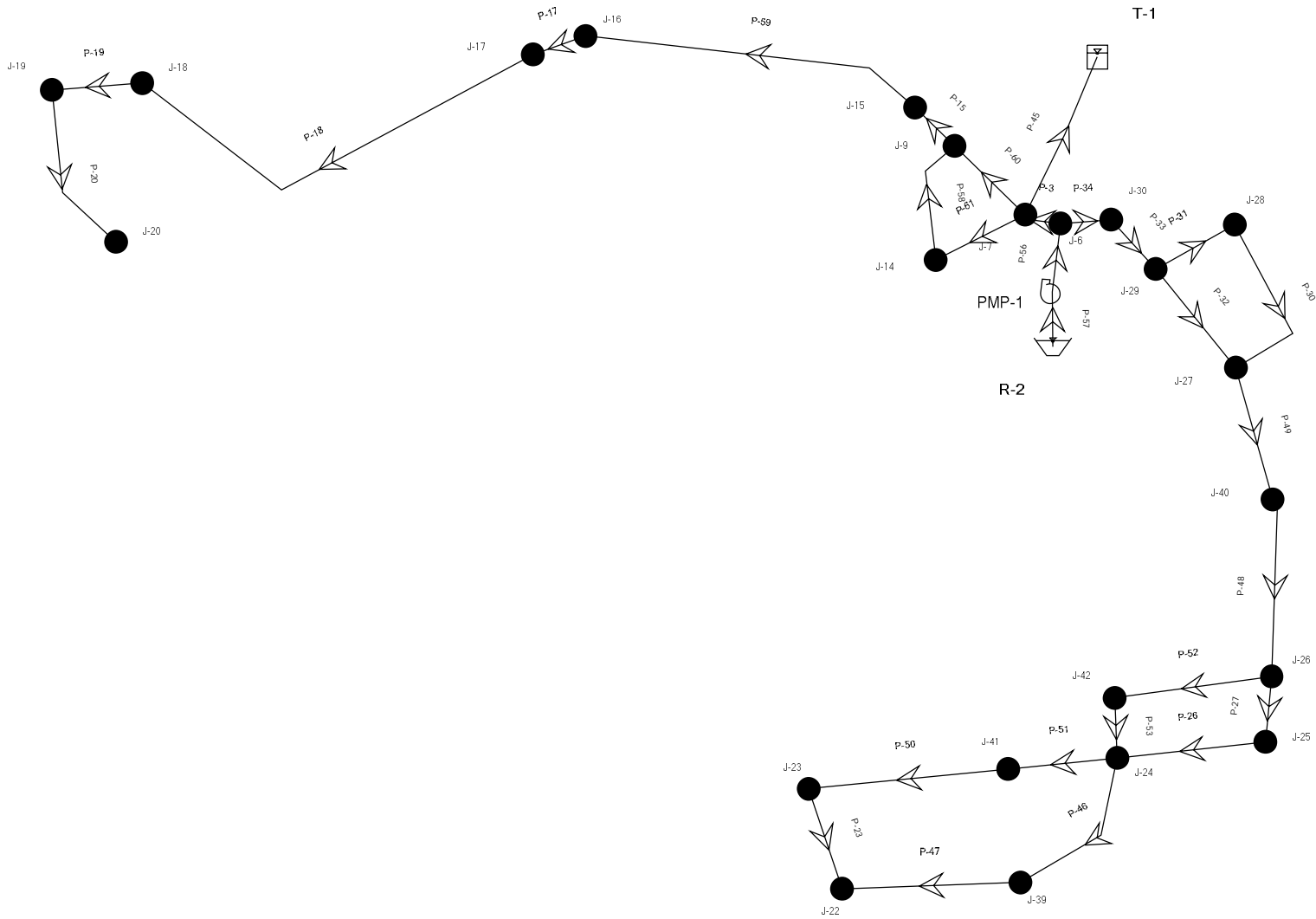
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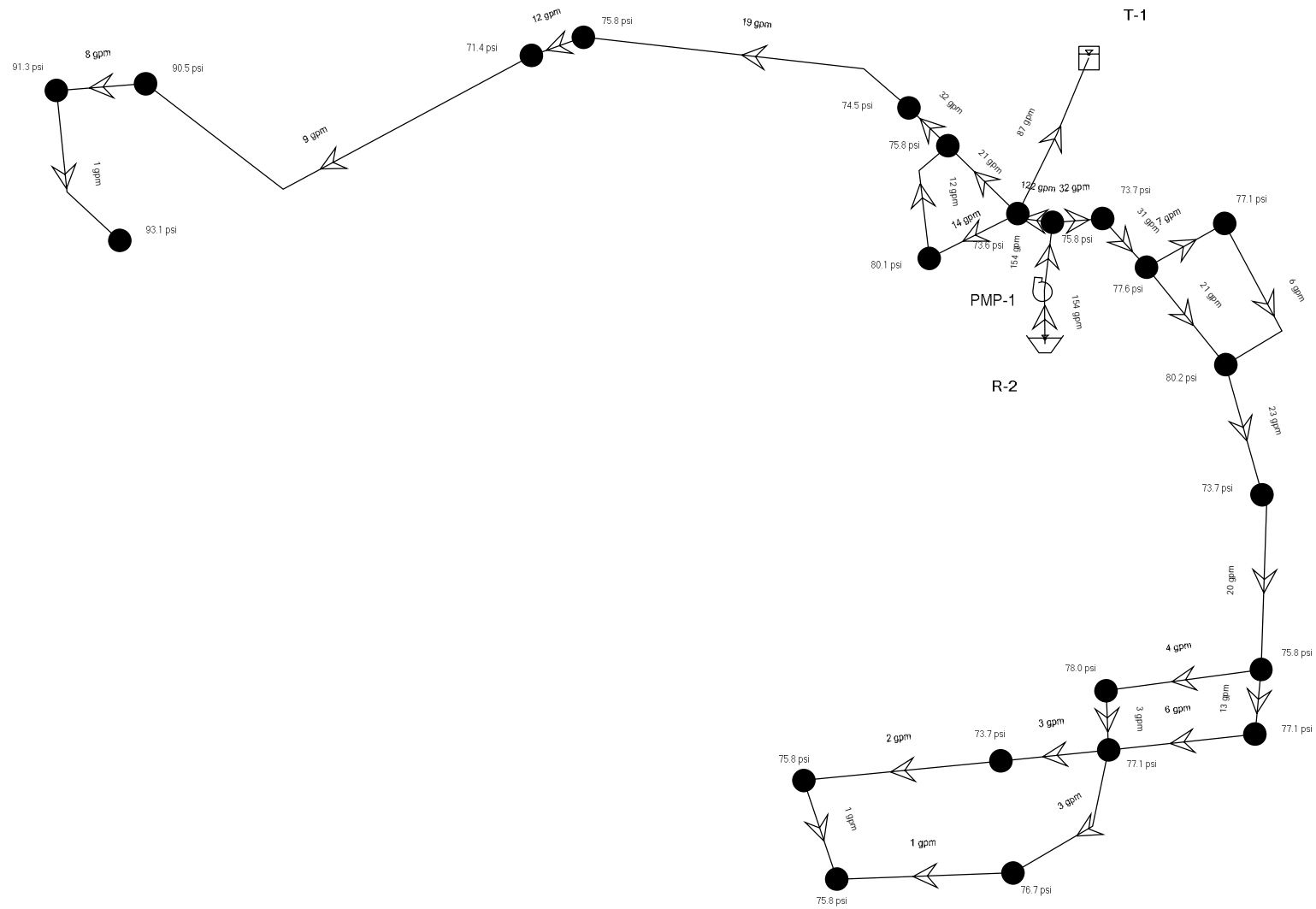
Exhibit 5

Hydraulic Models (Existing and Proposed) and Water Pressure Results

Scenario: Base



Scenario: Base



FlexTable: Junction Table (watercad.wtg)

Current Time: 0.000 hours

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-6	1,490.00	0	1,665.31	75.8
J-7	1,495.00	0	1,665.22	73.6
J-9	1,490.00	1	1,665.19	75.8
J-14	1,480.00	1	1,665.21	80.1
J-15	1,493.00	13	1,665.18	74.5
J-16	1,490.00	7	1,665.09	75.8
J-17	1,500.00	3	1,665.09	71.4
J-18	1,456.00	1	1,665.08	90.5
J-19	1,454.00	7	1,665.08	91.3
J-20	1,450.00	1	1,665.08	93.1
J-22	1,490.00	1	1,665.24	75.8
J-23	1,490.00	1	1,665.24	75.8
J-24	1,487.00	3	1,665.24	77.1
J-25	1,487.00	7	1,665.24	77.1
J-26	1,490.00	3	1,665.25	75.8
J-27	1,480.00	4	1,665.27	80.2
J-28	1,487.00	1	1,665.28	77.1
J-29	1,486.00	3	1,665.29	77.6
J-30	1,495.00	1	1,665.30	73.7
J-39	1,488.00	3	1,665.24	76.7
J-40	1,495.00	3	1,665.26	73.7
J-41	1,495.00	1	1,665.24	73.7
J-42	1,485.00	1	1,665.24	78.0

FlexTable: Pipe Table (watercad.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-3	203	J-6	J-7	8.0	Ductile Iron	120.0	122	0.78
P-15	304	J-9	J-15	8.0	Ductile Iron	120.0	32	0.21
P-17	308	J-16	J-17	8.0	Ductile Iron	120.0	12	0.08
P-18	2,542	J-17	J-18	8.0	Ductile Iron	120.0	9	0.06
P-19	500	J-18	J-19	8.0	Ductile Iron	120.0	8	0.05
P-20	970	J-19	J-20	8.0	Ductile Iron	120.0	1	0.01
P-23	581	J-22	J-23	8.0	Ductile Iron	120.0	-1	0.00
P-26	821	J-24	J-25	8.0	Ductile Iron	120.0	-6	0.04
P-27	362	J-25	J-26	8.0	Ductile Iron	120.0	-13	0.08
P-30	1,045	J-27	J-28	6.0	Ductile Iron	120.0	-6	0.07
P-31	500	J-28	J-29	6.0	Ductile Iron	120.0	-7	0.08
P-32	701	J-29	J-27	8.0	Ductile Iron	120.0	21	0.13
P-33	366	J-29	J-30	8.0	Ductile Iron	120.0	-31	0.20
P-34	280	J-30	J-6	8.0	Ductile Iron	120.0	-32	0.21
P-45	956	J-7	T-1	8.0	Ductile Iron	120.0	87	0.56
P-46	951	J-24	J-39	8.0	Ductile Iron	120.0	3	0.02
P-47	984	J-39	J-22	8.0	Ductile Iron	120.0	1	0.00
P-48	983	J-26	J-40	8.0	Ductile Iron	120.0	-20	0.13
P-49	752	J-40	J-27	8.0	Ductile Iron	120.0	-23	0.15
P-50	1,104	J-23	J-41	8.0	Ductile Iron	120.0	-2	0.01
P-51	606	J-41	J-24	8.0	Ductile Iron	120.0	-3	0.02
P-52	875	J-26	J-42	6.0	Ductile Iron	120.0	4	0.05
P-53	331	J-42	J-24	6.0	Ductile Iron	120.0	3	0.04
P-56	381	J-6	PMP-1	8.0	Ductile Iron	120.0	-154	0.98
P-57	301	PMP-1	R-2	8.0	Ductile Iron	120.0	-154	0.98
P-58	706	J-9	J-14	6.0	Ductile Iron	120.0	-12	0.14
P-59	1,907	J-16	J-15	6.0	Ductile Iron	130.0	-19	0.21
P-60	543	J-9	J-7	6.0	Ductile Iron	130.0	-21	0.24
P-61	554	J-7	J-14	6.0	Ductile Iron	130.0	14	0.15

Fire Flow Node FlexTable: Fire Flow Report (watercad.wtg)

Current Time: 0.000 hours

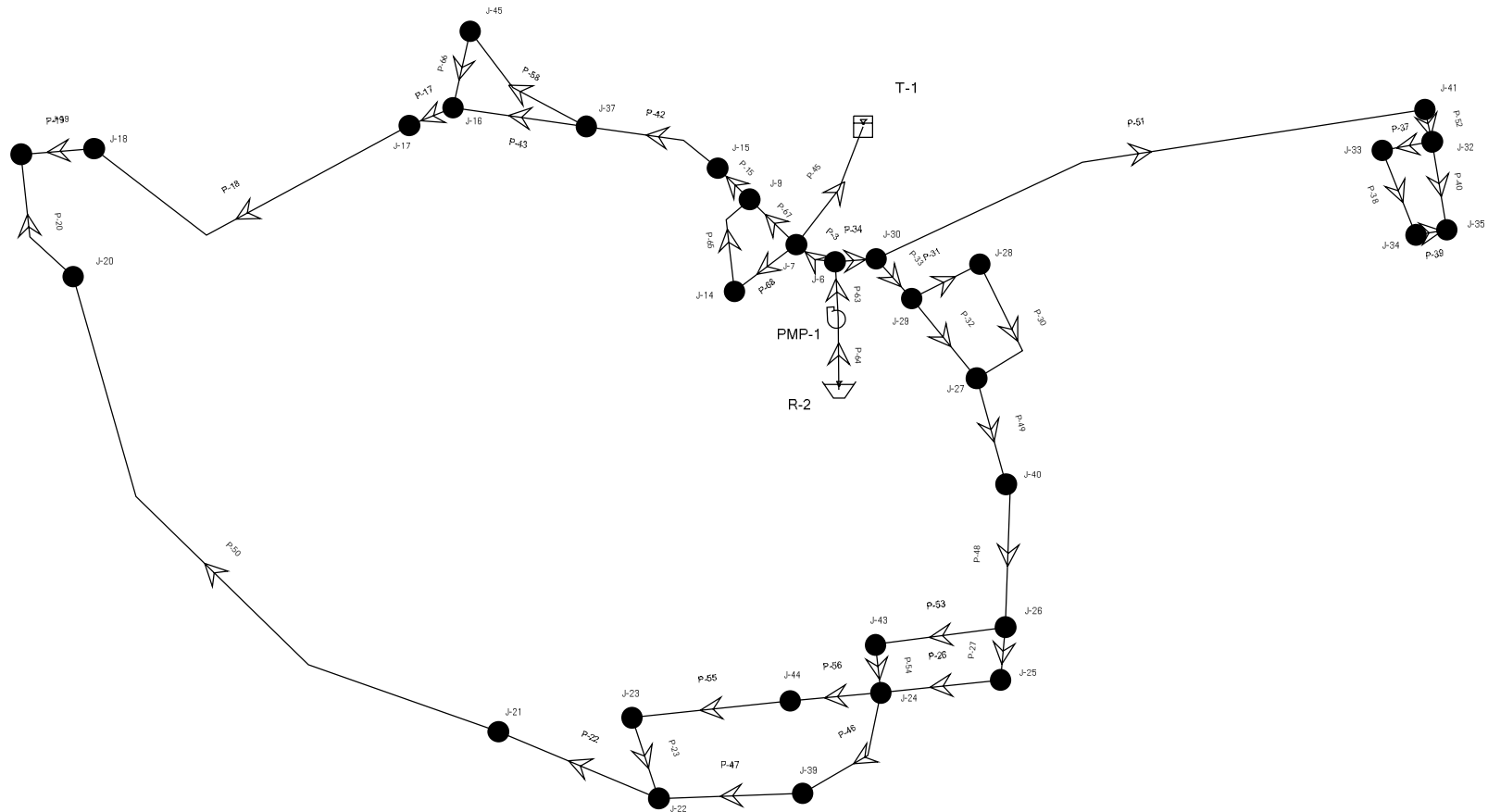
Label	Zone	Fire Flow Iterations	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)
J-6	<None>	5	True	500	3,056	0	3,056	20.0
J-7	<None>	5	True	500	3,308	0	3,308	20.0
J-9	<None>	19	True	500	2,309	1	2,310	20.0
J-14	<None>	3	True	500	2,460	1	2,461	20.0
J-15	<None>	4	True	500	2,103	13	2,116	20.0
J-16	<None>	35	True	500	932	7	939	20.0
J-17	<None>	3	True	500	915	3	917	20.0
J-18	<None>	3	True	500	909	1	910	20.0
J-19	<None>	3	True	500	892	7	899	20.0
J-20	<None>	3	True	500	865	1	866	20.0
J-22	<None>	2	True	500	1,304	1	1,305	20.0
J-23	<None>	2	True	500	1,306	1	1,307	20.0
J-24	<None>	33	True	500	1,372	3	1,374	20.0
J-25	<None>	4	True	500	1,439	7	1,445	20.0
J-26	<None>	4	True	500	1,482	3	1,485	20.0
J-27	<None>	5	True	500	2,061	4	2,065	20.0
J-28	<None>	3	True	500	1,925	1	1,927	20.0
J-29	<None>	5	True	500	2,336	3	2,338	20.0
J-30	<None>	4	True	500	2,676	1	2,677	20.0
J-39	<None>	16	True	500	1,332	3	1,335	20.0
J-40	<None>	4	True	500	1,743	3	1,746	20.0
J-41	<None>	2	True	500	1,319	1	1,321	20.0
J-42	<None>	2	True	500	1,376	1	1,377	20.0

Fire Flow Node FlexTable: Fire Flow Report (watercad.wtg)

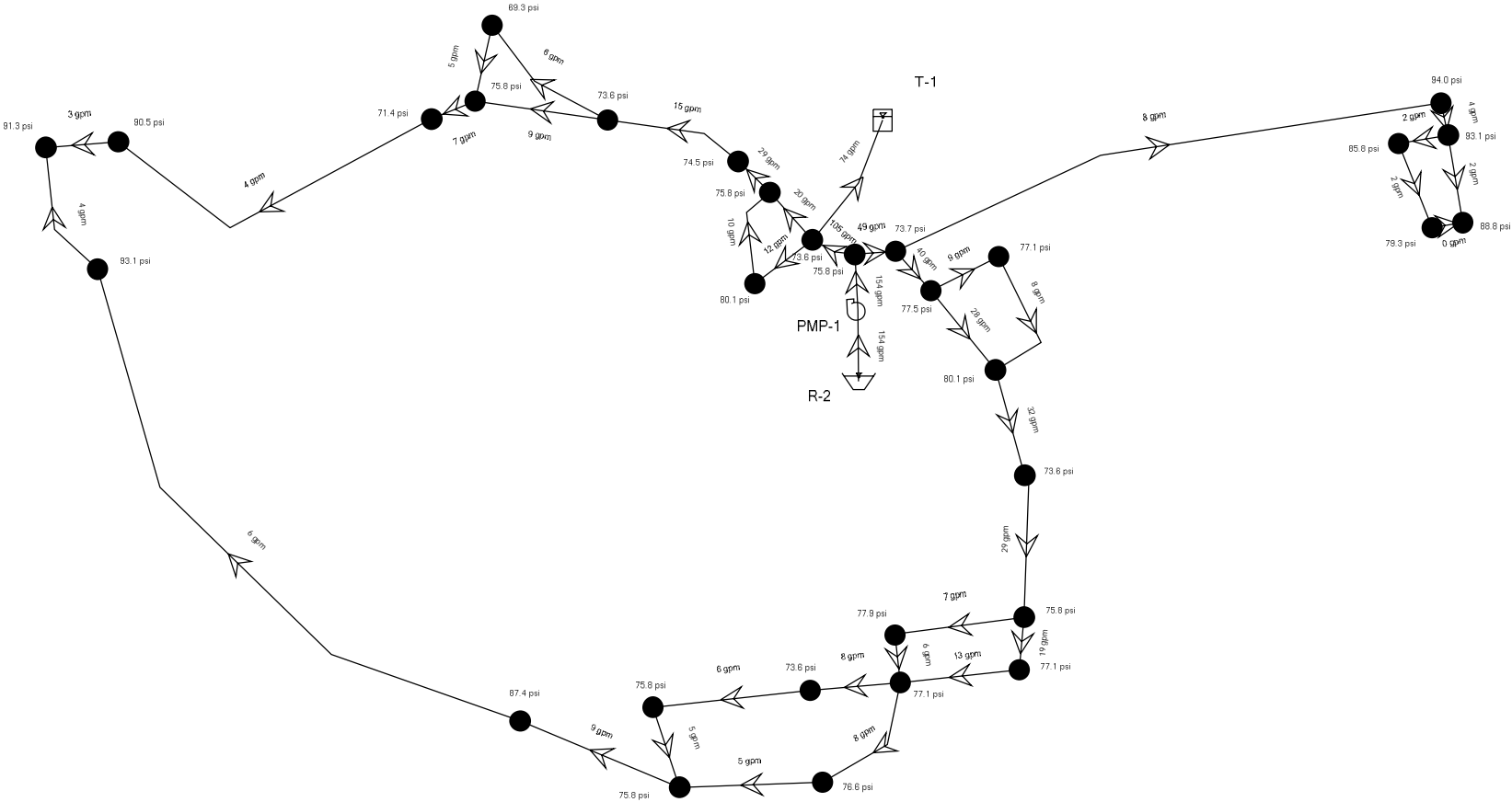
Current Time: 0.000 hours

Pressure (Calculated Residual) (psi)	Pressure (Zone Lower Limit) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pressure (System Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)	Is Fire Flow Run Balanced?
2.2	20.0	0.0	J-41	20.0	0.0	J-41	True
2.2	20.0	0.0	J-17	20.0	0.0	J-17	True
4.4	20.0	0.0	J-17	20.0	0.0	J-17	True
0.0	20.0	14.2	J-17	20.0	14.2	J-17	True
3.1	20.0	0.0	J-17	20.0	0.0	J-17	True
4.4	20.0	0.0	J-17	20.0	0.0	J-17	True
0.0	20.0	6.8	J-16	20.0	6.8	J-16	True
0.0	20.0	0.9	J-17	20.0	0.9	J-17	True
0.0	20.0	1.7	J-20	20.0	1.7	J-20	True
0.0	20.0	5.1	J-19	20.0	5.1	J-19	True
0.0	20.0	2.2	J-23	20.0	2.2	J-23	True
0.0	20.0	2.0	J-22	20.0	2.0	J-22	True
3.5	20.0	0.1	J-41	20.0	0.1	J-41	True
2.9	20.0	0.0	J-41	20.0	0.0	J-41	True
2.2	20.0	0.0	J-41	20.0	0.0	J-41	True
6.5	20.0	0.0	J-41	20.0	0.0	J-41	True
0.0	20.0	18.4	J-41	20.0	18.4	J-41	True
3.9	20.0	0.0	J-41	20.0	0.0	J-41	True
0.0	20.0	0.0	J-41	20.0	0.0	J-41	True
0.1	20.0	1.3	J-22	20.0	1.3	J-22	True
0.0	20.0	0.0	J-41	20.0	0.0	J-41	True
0.0	20.0	3.7	J-23	20.0	3.7	J-23	True
0.0	20.0	2.9	J-41	20.0	2.9	J-41	True

Scenario: Base



Scenario: Base



FlexTable: Junction Table (proposed system.wtg)

Current Time: 0.000 hours

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-6	1,490.00	0	1,665.26	75.8
J-7	1,495.00	0	1,665.16	73.6
J-9	1,490.00	1	1,665.14	75.8
J-14	1,480.00	1	1,665.15	80.1
J-15	1,493.00	13	1,665.13	74.5
J-16	1,490.00	7	1,665.11	75.8
J-17	1,500.00	3	1,665.11	71.4
J-18	1,456.00	1	1,665.11	90.5
J-19	1,454.00	7	1,665.11	91.3
J-20	1,450.00	3	1,665.11	93.1
J-21	1,463.00	3	1,665.12	87.4
J-22	1,490.00	1	1,665.12	75.8
J-23	1,490.00	1	1,665.12	75.8
J-24	1,487.00	3	1,665.13	77.1
J-25	1,487.00	7	1,665.13	77.1
J-26	1,490.00	3	1,665.14	75.8
J-27	1,480.00	4	1,665.19	80.1
J-28	1,487.00	1	1,665.21	77.1
J-29	1,486.00	3	1,665.21	77.5
J-30	1,495.00	1	1,665.23	73.7
J-32	1,450.00	0	1,665.22	93.1
J-33	1,467.00	0	1,665.22	85.8
J-34	1,482.00	1	1,665.22	79.3
J-35	1,460.00	3	1,665.22	88.8
J-37	1,495.00	0	1,665.12	73.6
J-39	1,488.00	3	1,665.13	76.6
J-40	1,495.00	3	1,665.17	73.6
J-41	1,448.00	4	1,665.22	94.0
J-43	1,485.00	1	1,665.13	77.9
J-44	1,495.00	1	1,665.13	73.6
J-45	1,505.00	1	1,665.12	69.3

FlexTable: Pipe Table (proposed system.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-3	301	J-6	J-7	8.0	Ductile Iron	120.0	105	0.67
P-15	304	J-9	J-15	8.0	Ductile Iron	120.0	29	0.18
P-17	329	J-16	J-17	8.0	Ductile Iron	120.0	7	0.05
P-18	2,542	J-17	J-18	8.0	Ductile Iron	120.0	4	0.03
P-19	500	J-18	J-19	8.0	Ductile Iron	120.0	3	0.02
P-20	970	J-19	J-20	8.0	Ductile Iron	120.0	-4	0.02
P-22	1,187	J-21	J-22	8.0	Ductile Iron	120.0	-9	0.06
P-23	581	J-22	J-23	8.0	Ductile Iron	120.0	-5	0.03
P-26	821	J-24	J-25	8.0	Ductile Iron	120.0	-13	0.08
P-27	362	J-25	J-26	8.0	Ductile Iron	120.0	-19	0.12
P-30	1,023	J-27	J-28	6.0	Ductile Iron	120.0	-8	0.09
P-31	521	J-28	J-29	6.0	Ductile Iron	120.0	-9	0.11
P-32	701	J-29	J-27	8.0	Ductile Iron	120.0	28	0.18
P-33	366	J-29	J-30	8.0	Ductile Iron	120.0	-40	0.25
P-34	280	J-30	J-6	8.0	Ductile Iron	120.0	-49	0.31
P-37	347	J-32	J-33	8.0	Ductile Iron	120.0	2	0.01
P-38	623	J-33	J-34	8.0	Ductile Iron	120.0	2	0.01
P-39	214	J-34	J-35	8.0	Ductile Iron	120.0	0	0.00
P-40	611	J-35	J-32	8.0	Ductile Iron	120.0	-2	0.01
P-42	974	J-15	J-37	8.0	Ductile Iron	120.0	15	0.10
P-43	934	J-37	J-16	8.0	Ductile Iron	120.0	9	0.06
P-45	935	J-7	T-1	8.0	Ductile Iron	120.0	74	0.47
P-46	951	J-24	J-39	8.0	Ductile Iron	120.0	8	0.05
P-47	984	J-39	J-22	8.0	Ductile Iron	120.0	5	0.03
P-48	983	J-26	J-40	8.0	Ductile Iron	120.0	-29	0.19
P-49	752	J-40	J-27	8.0	Ductile Iron	120.0	-32	0.20
P-50	4,585	J-20	J-21	8.0	Ductile Iron	120.0	-6	0.04
P-51	3,924	J-30	J-41	8.0	Ductile Iron	120.0	8	0.05
P-52	225	J-41	J-32	8.0	Ductile Iron	120.0	4	0.03
P-53	898	J-26	J-43	6.0	Ductile Iron	120.0	7	0.08
P-54	330	J-43	J-24	6.0	Ductile Iron	120.0	6	0.07
P-55	1,087	J-23	J-44	8.0	Ductile Iron	120.0	-6	0.04
P-56	623	J-44	J-24	8.0	Ductile Iron	120.0	-8	0.05
P-58	1,051	J-45	J-37	8.0	Ductile Iron	120.0	-6	0.04
P-63	380	J-6	PMP-1	8.0	Ductile Iron	120.0	-154	0.98
P-64	494	PMP-1	R-2	8.0	Ductile Iron	120.0	-154	0.98
P-65	705	J-9	J-14	6.0	Ductile Iron	120.0	-10	0.12

FlexTable: Pipe Table (proposed system.wtg)

Current Time: 0.000 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
P-66	503	J-16	J-45	6.0	Ductile Iron	130.0	-5	0.05
P-67	445	J-9	J-7	6.0	Ductile Iron	130.0	-20	0.22
P-68	531	J-7	J-14	6.0	Ductile Iron	130.0	12	0.13

Fire Flow Node FlexTable: Fire Flow Report (proposed system.wtg)

Current Time: 0.000 hours

Label	Zone	Fire Flow Iterations	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)
J-6	<None>	2	True	500	2,000	500	2,000	20.0
J-7	<None>	2	True	500	2,000	500	2,000	20.0
J-9	<None>	2	True	500	2,000	501	2,001	20.0
J-14	<None>	2	True	500	2,000	501	2,001	20.0
J-15	<None>	3	True	500	1,999	513	2,012	20.0
J-16	<None>	4	True	500	1,678	507	1,685	20.0
J-17	<None>	4	True	500	1,619	503	1,621	20.0
J-18	<None>	3	True	500	1,680	501	1,681	20.0
J-19	<None>	3	True	500	1,667	507	1,674	20.0
J-20	<None>	2	True	500	1,657	503	1,660	20.0
J-21	<None>	20	True	500	1,614	503	1,616	20.0
J-22	<None>	18	True	500	1,539	501	1,540	20.0
J-23	<None>	3	True	500	1,502	501	1,503	20.0
J-24	<None>	35	True	500	1,558	503	1,561	20.0
J-25	<None>	4	True	500	1,620	507	1,626	20.0
J-26	<None>	19	True	500	1,643	503	1,645	20.0
J-27	<None>	3	True	500	1,973	504	1,977	20.0
J-28	<None>	3	True	500	1,725	501	1,727	20.0
J-29	<None>	2	True	500	2,000	503	2,003	20.0
J-30	<None>	2	True	500	2,000	501	2,001	20.0
J-32	<None>	4	True	500	1,101	500	1,101	20.0
J-33	<None>	4	True	500	1,091	500	1,091	20.0
J-34	<None>	3	True	500	1,075	501	1,076	20.0
J-35	<None>	4	True	500	1,081	503	1,083	20.0
J-37	<None>	35	True	500	1,704	500	1,704	20.0
J-39	<None>	3	True	500	1,521	503	1,523	20.0
J-40	<None>	3	True	500	1,762	503	1,765	20.0
J-41	<None>	5	True	500	1,127	504	1,131	20.0
J-43	<None>	3	True	500	1,493	501	1,495	20.0
J-44	<None>	3	True	500	1,480	501	1,481	20.0
J-45	<None>	3	True	500	1,552	501	1,554	20.0

Fire Flow Node FlexTable: Fire Flow Report (proposed system.wtg)

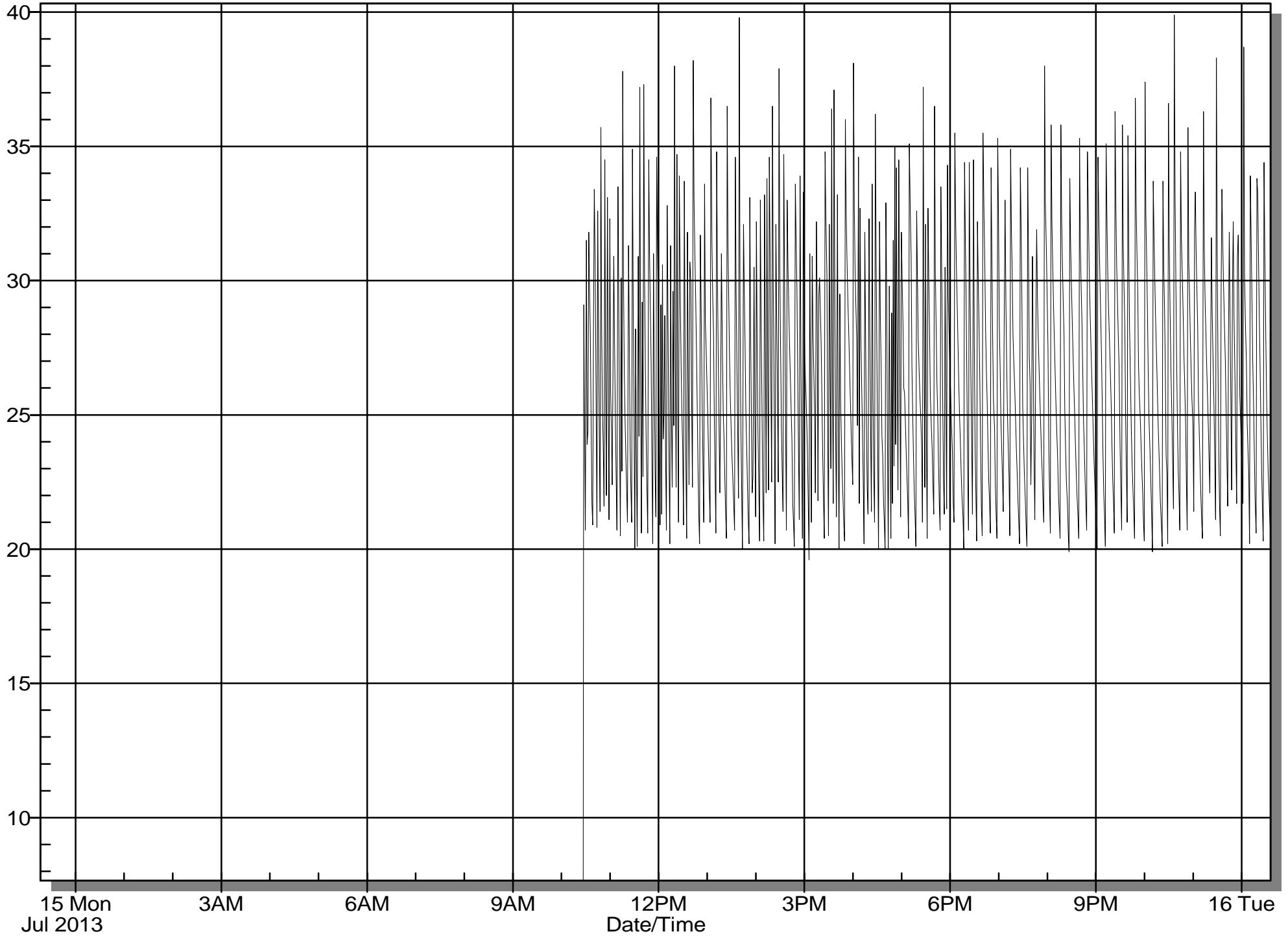
Current Time: 0.000 hours

Pressure (Calculated Residual) (psi)	Pressure (Zone Lower Limit) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pressure (System Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)	Is Fire Flow Run Balanced?
41.7	20.0	39.7	J-30	20.0	39.7	J-30	True
46.2	20.0	41.8	J-45	20.0	41.8	J-45	True
31.0	20.0	25.8	J-45	20.0	25.8	J-45	True
28.8	20.0	35.8	J-45	20.0	35.8	J-45	True
23.7	20.0	20.0	J-45	20.0	20.0	J-45	True
23.6	20.0	20.0	J-17	20.0	20.0	J-17	True
20.0	20.0	24.9	J-45	20.0	24.9	J-45	True
20.0	20.0	23.0	J-19	20.0	23.0	J-19	True
20.0	20.0	23.6	J-18	20.0	23.6	J-18	True
20.0	20.0	25.8	J-19	20.0	25.8	J-19	True
21.5	20.0	20.0	J-22	20.0	20.0	J-22	True
20.0	20.0	21.3	J-23	20.0	21.3	J-23	True
20.0	20.0	22.1	J-44	20.0	22.1	J-44	True
23.1	20.0	20.0	J-44	20.0	20.0	J-44	True
20.2	20.0	20.0	J-44	20.0	20.0	J-44	True
20.3	20.0	20.0	J-44	20.0	20.0	J-44	True
25.3	20.0	20.0	J-40	20.0	20.0	J-40	True
20.0	20.0	36.6	J-40	20.0	36.6	J-40	True
29.1	20.0	26.5	J-40	20.0	26.5	J-40	True
32.8	20.0	33.9	J-40	20.0	33.9	J-40	True
33.9	20.0	20.0	J-34	20.0	20.0	J-34	True
25.7	20.0	20.0	J-34	20.0	20.0	J-34	True
20.0	20.0	28.2	J-33	20.0	28.2	J-33	True
29.1	20.0	20.0	J-34	20.0	20.0	J-34	True
24.1	20.0	20.0	J-45	20.0	20.0	J-45	True
20.0	20.0	22.6	J-44	20.0	22.6	J-44	True
20.0	20.0	23.4	J-44	20.0	23.4	J-44	True
34.7	20.0	20.0	J-34	20.0	20.0	J-34	True
20.0	20.0	26.2	J-44	20.0	26.2	J-44	True
20.0	20.0	25.4	J-23	20.0	25.4	J-23	True
20.0	20.0	30.0	J-17	20.0	30.0	J-17	True

15 Leonard Drive

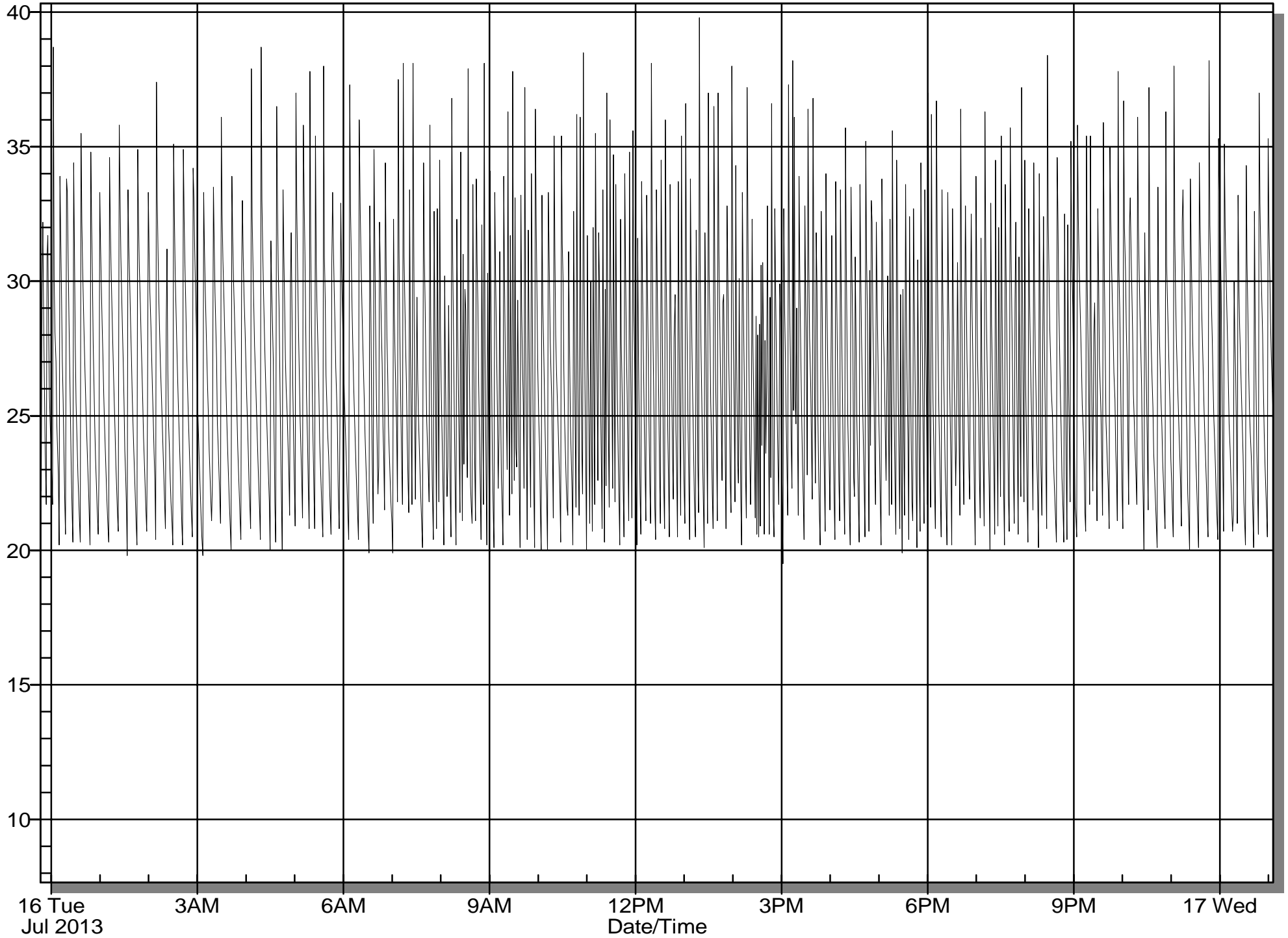
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(PR125 1)-Pressure/psig



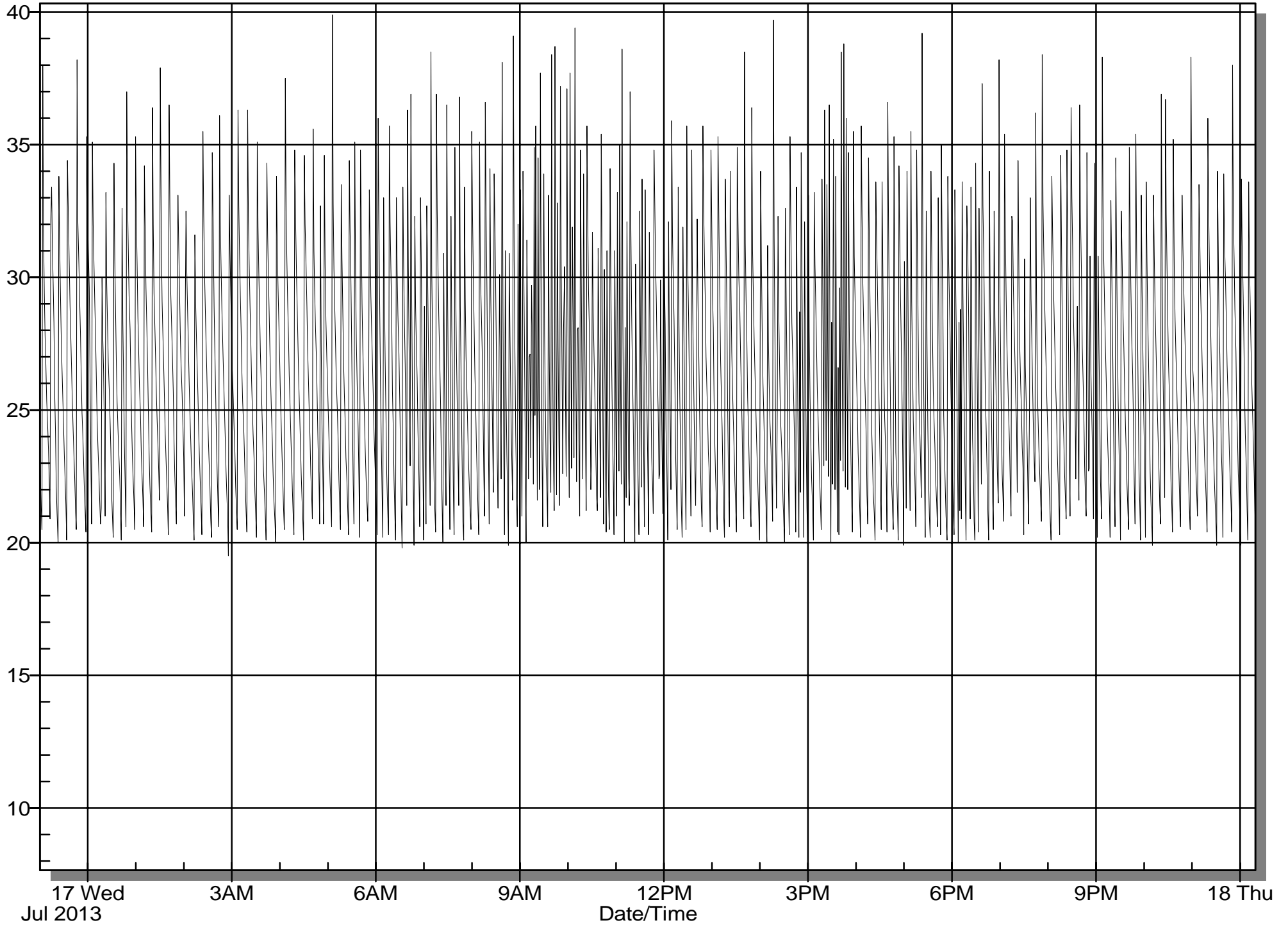
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(PR125 1)-Pressure/psig



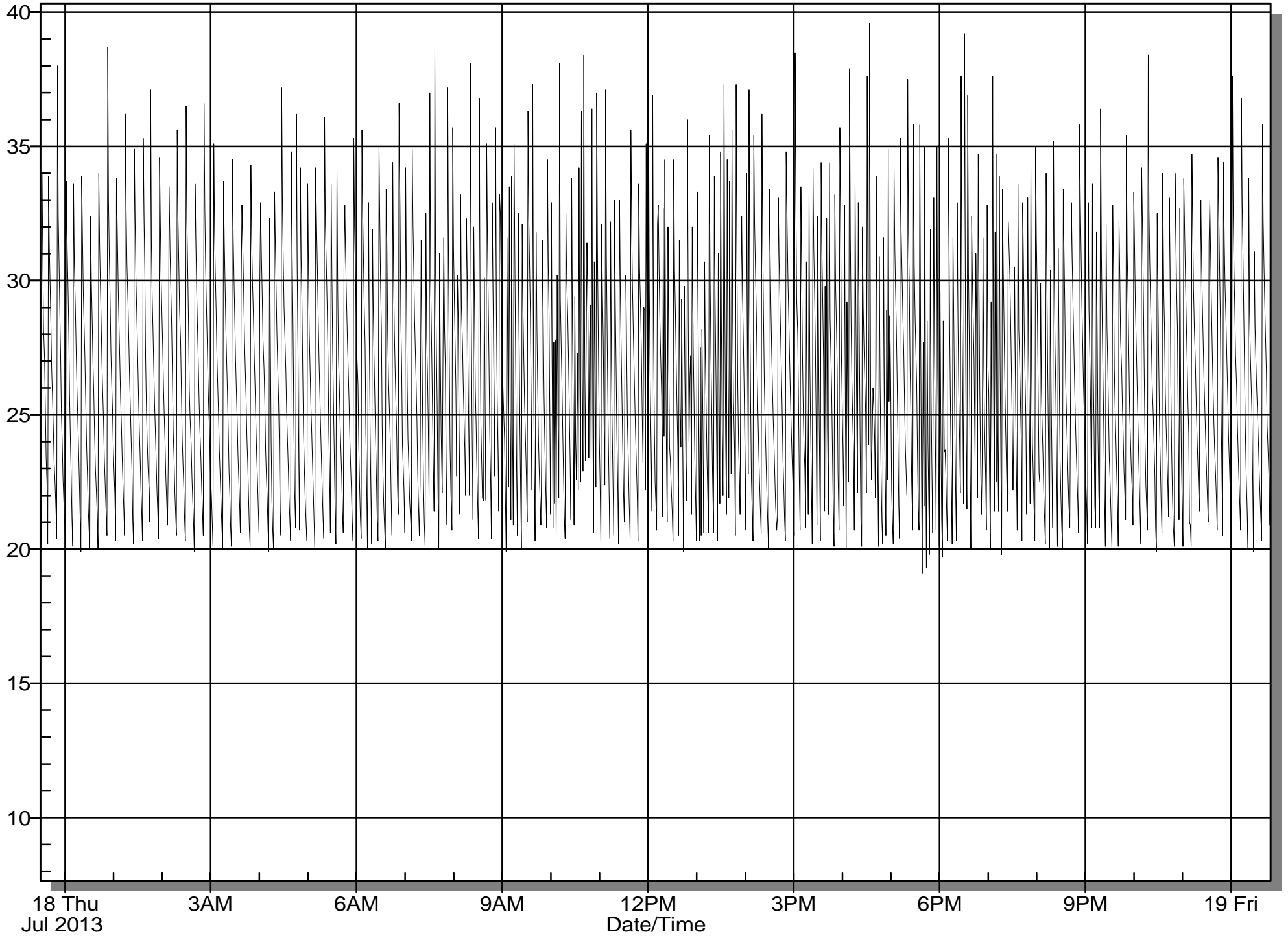
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(PR125 1)-Pressure/psig



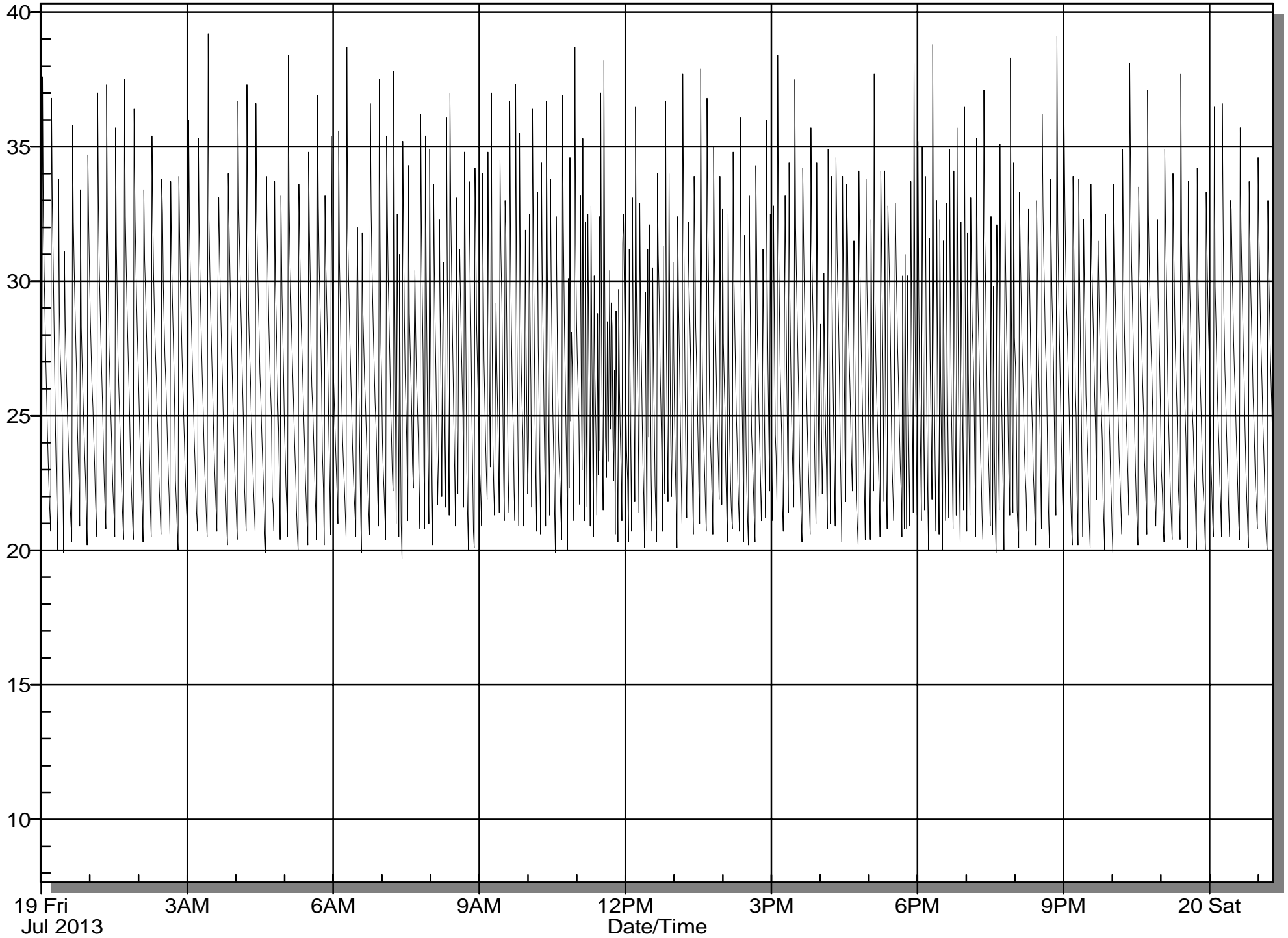
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(PR125 1)-Pressure/psig



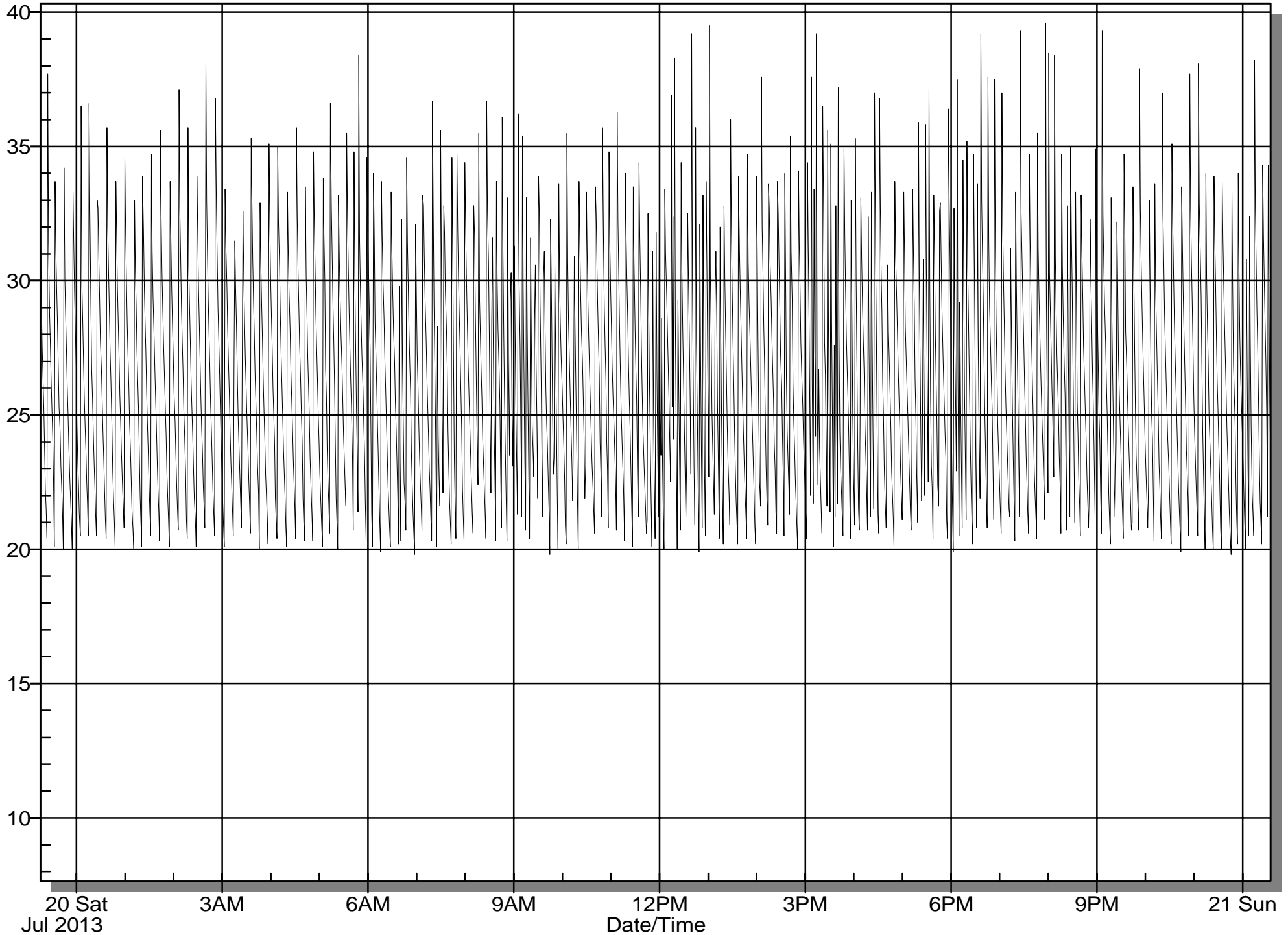
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(PR125 1)-Pressure/psig



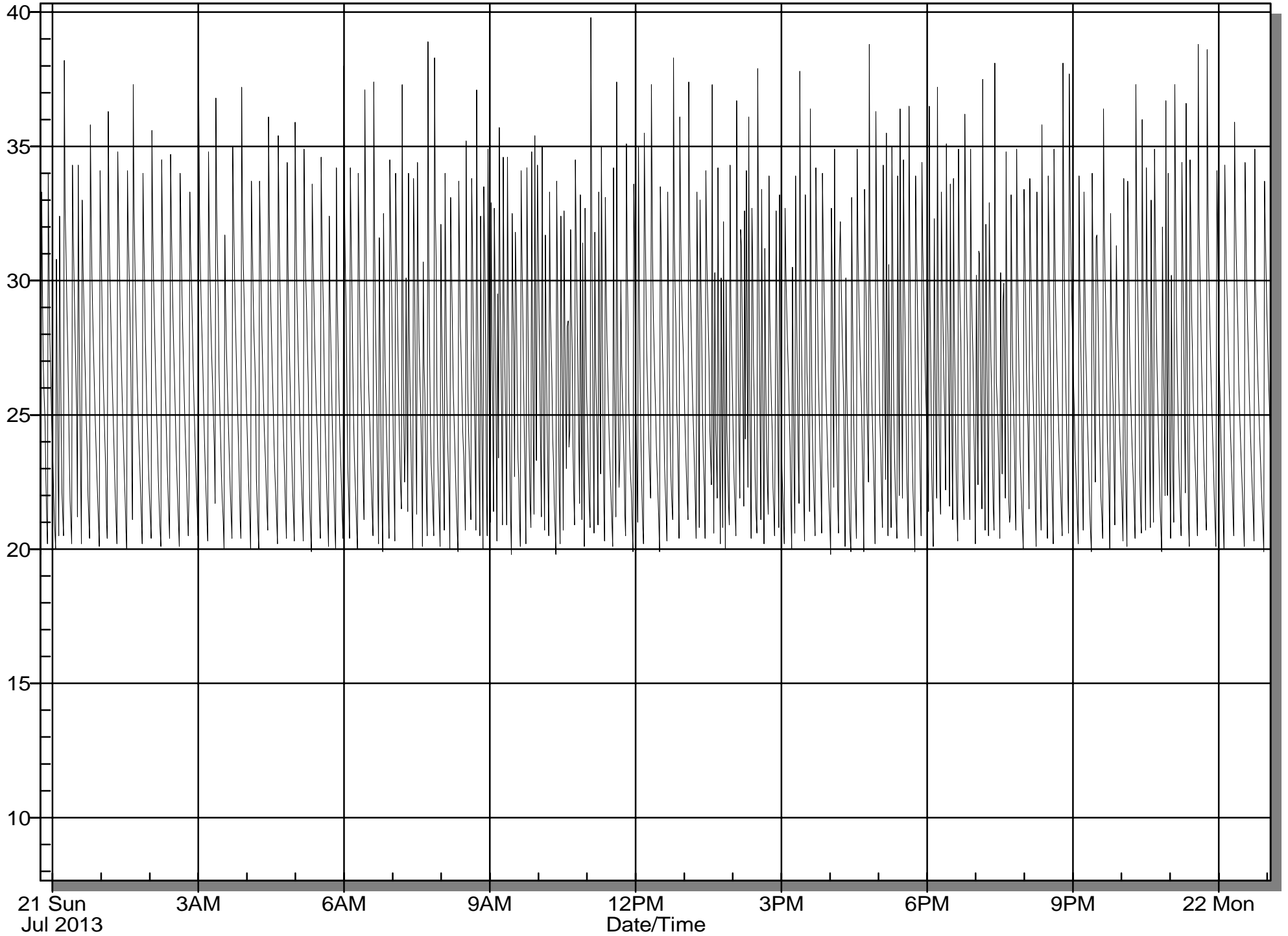
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(PR125 1)-Pressure/psig



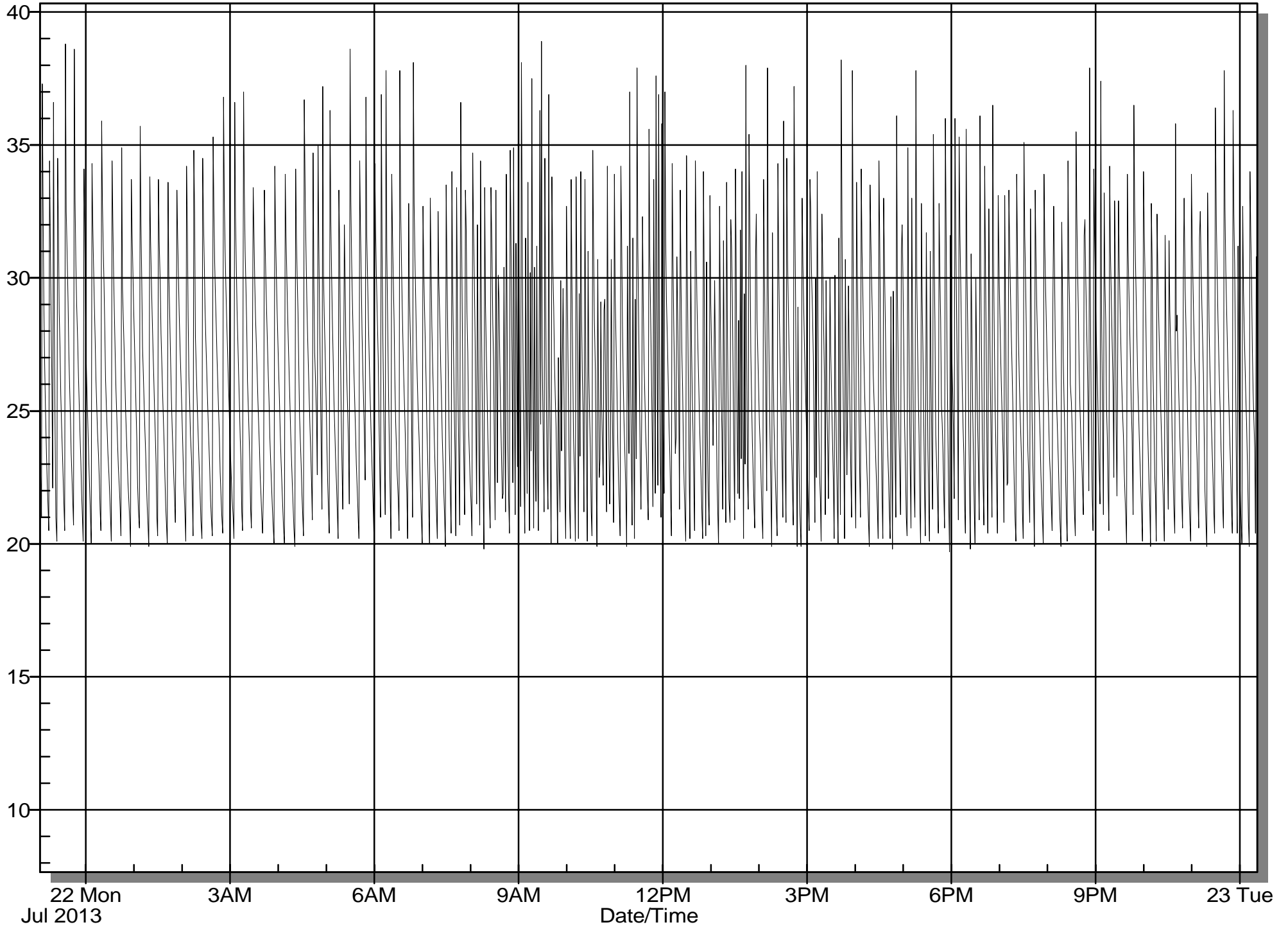
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(PR125 1)-Pressure/psig



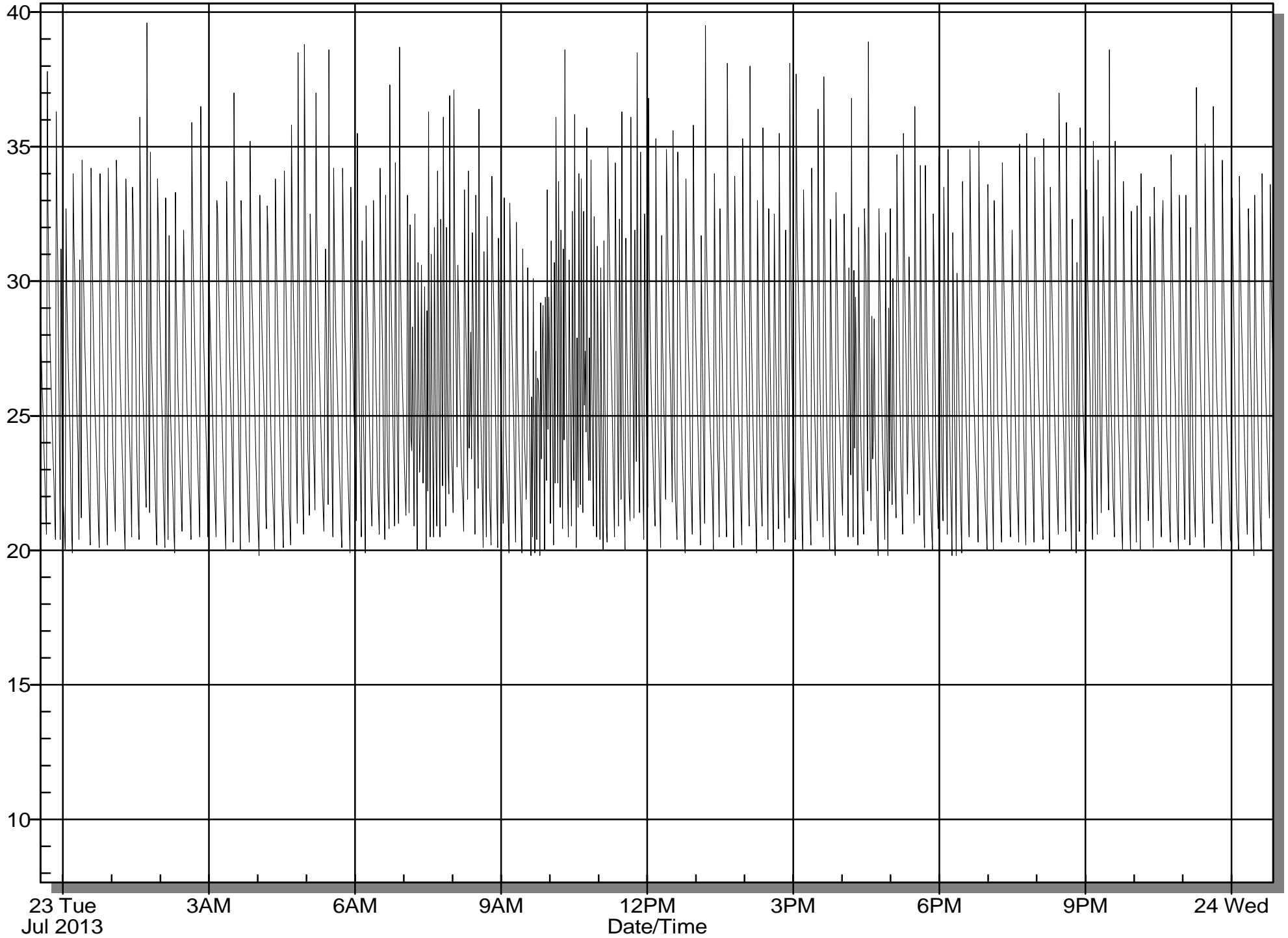
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(PR125 1)-Pressure/psig



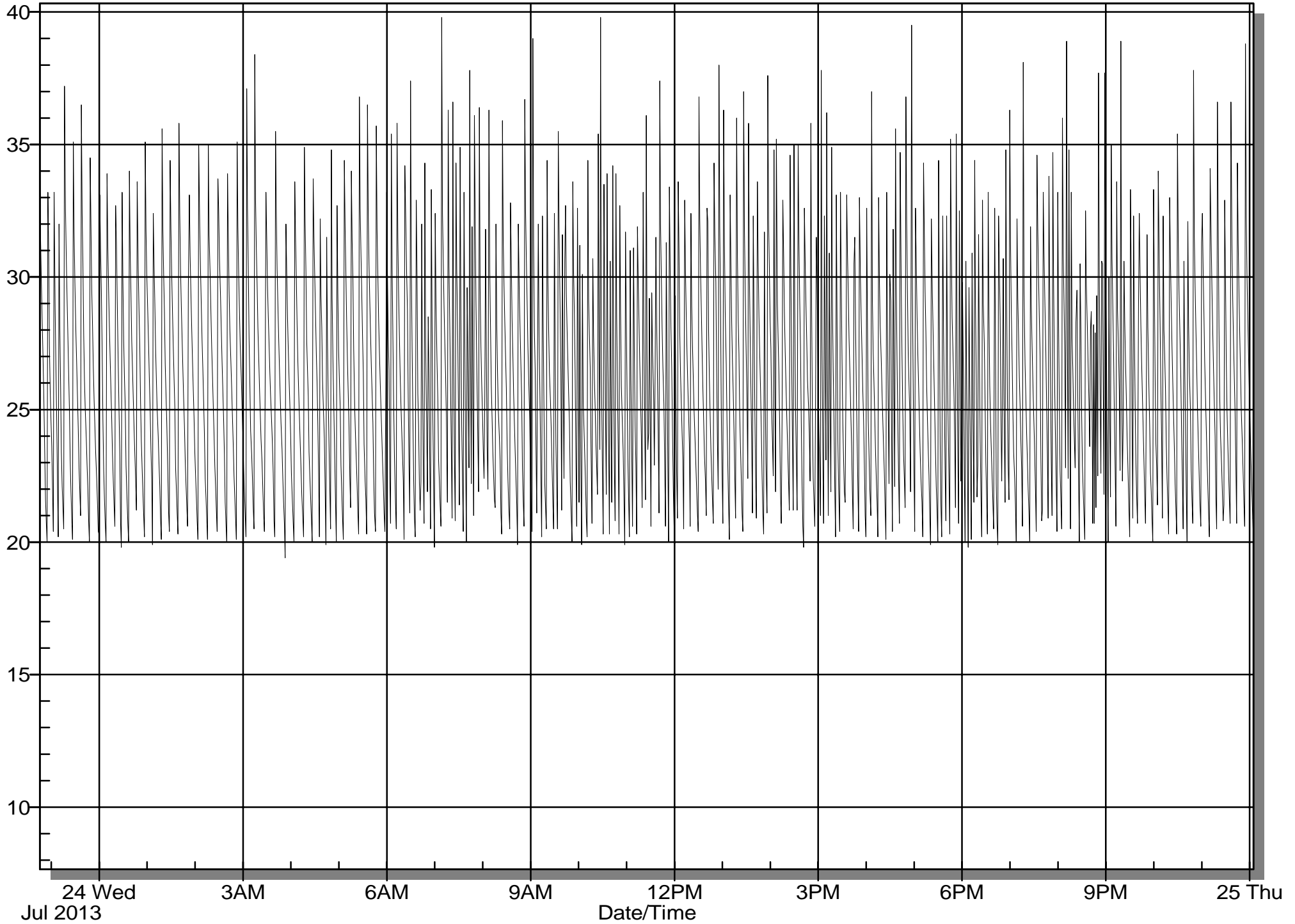
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(PR125 1)-Pressure/psig



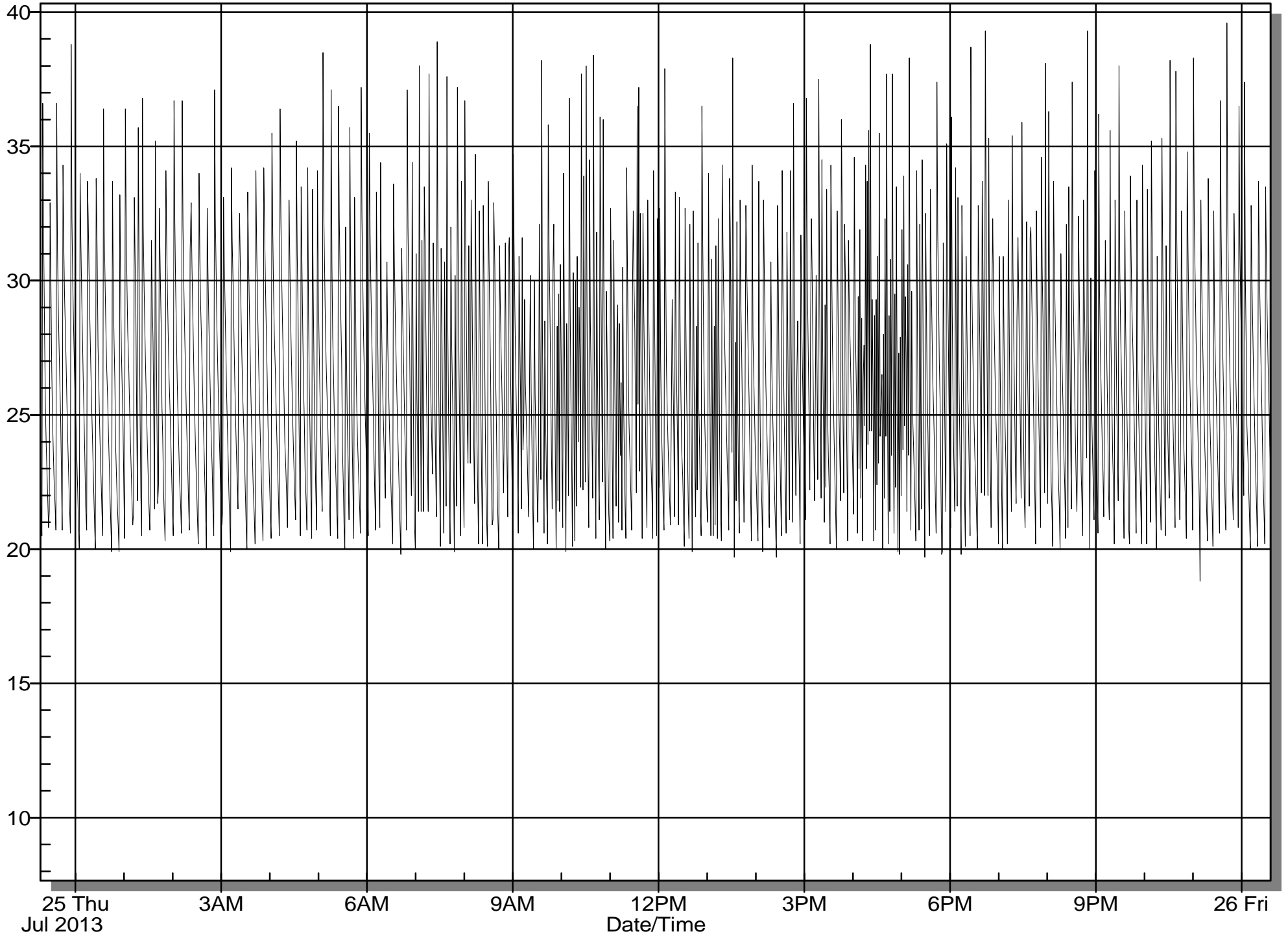
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(PR125 1)-Pressure/psig



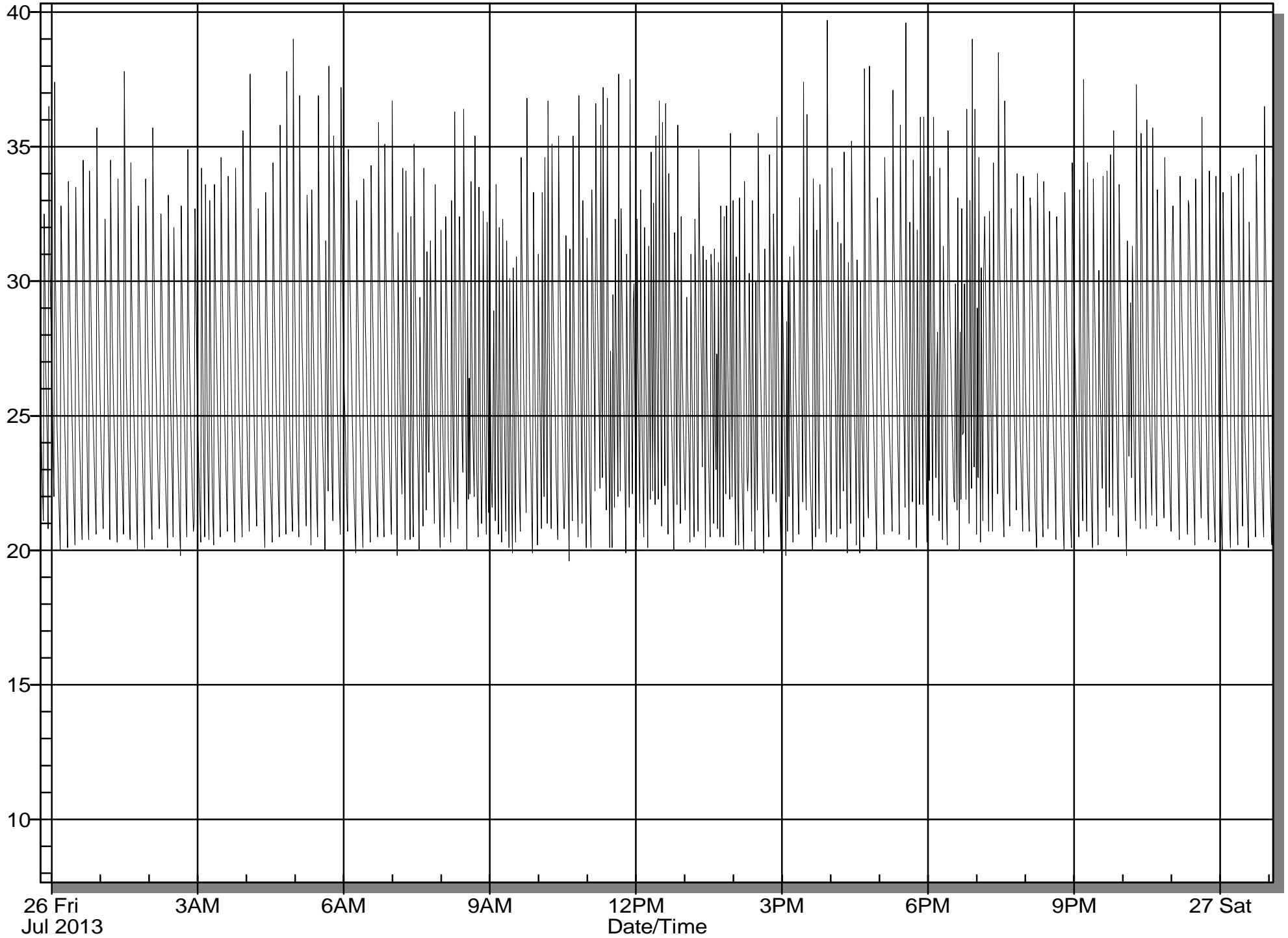
15 Leonard Drive

(PR125 1)-Pressure/psig



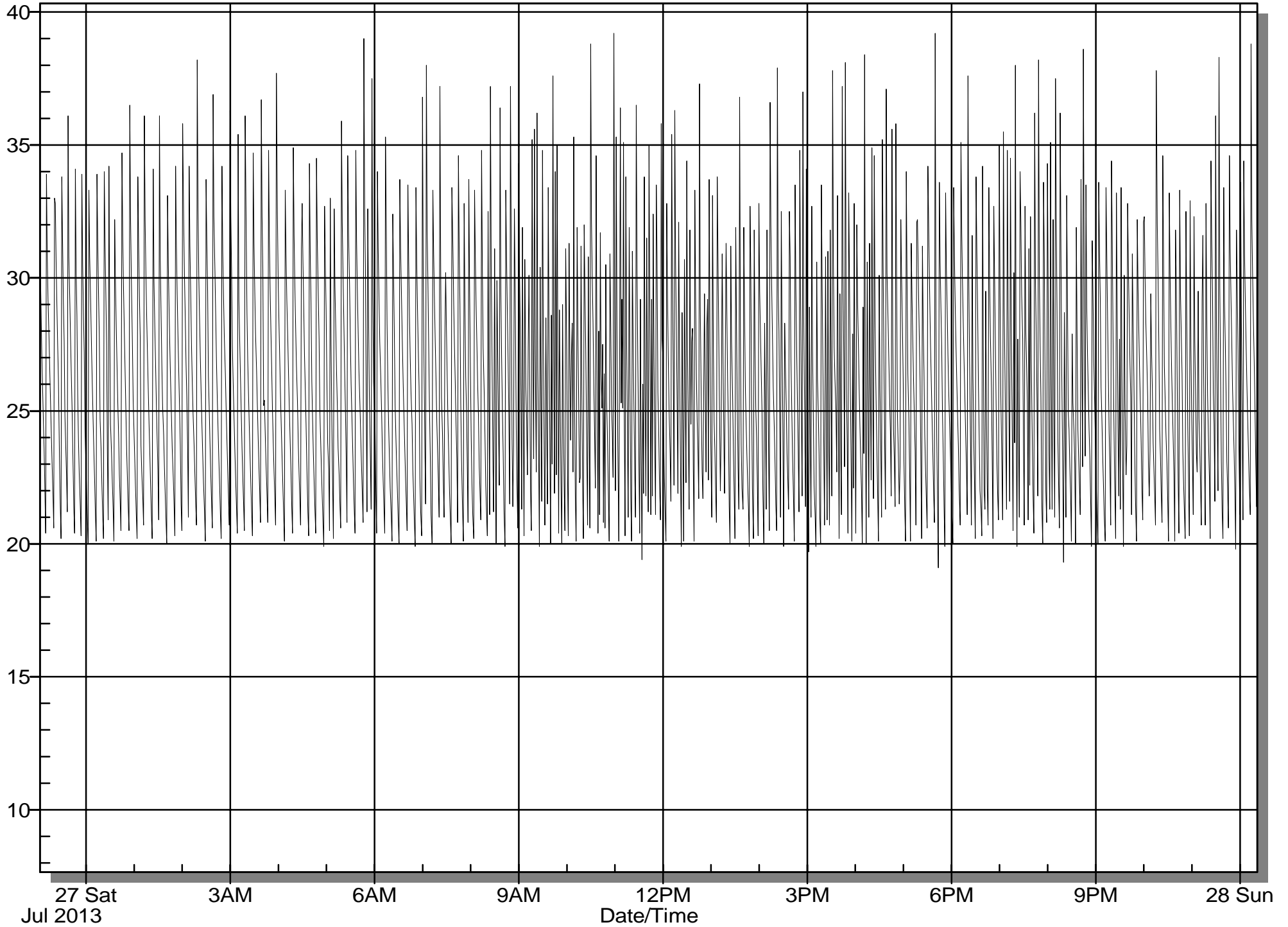
15 Leonard Drive

(PR125 1)-Pressure/psig



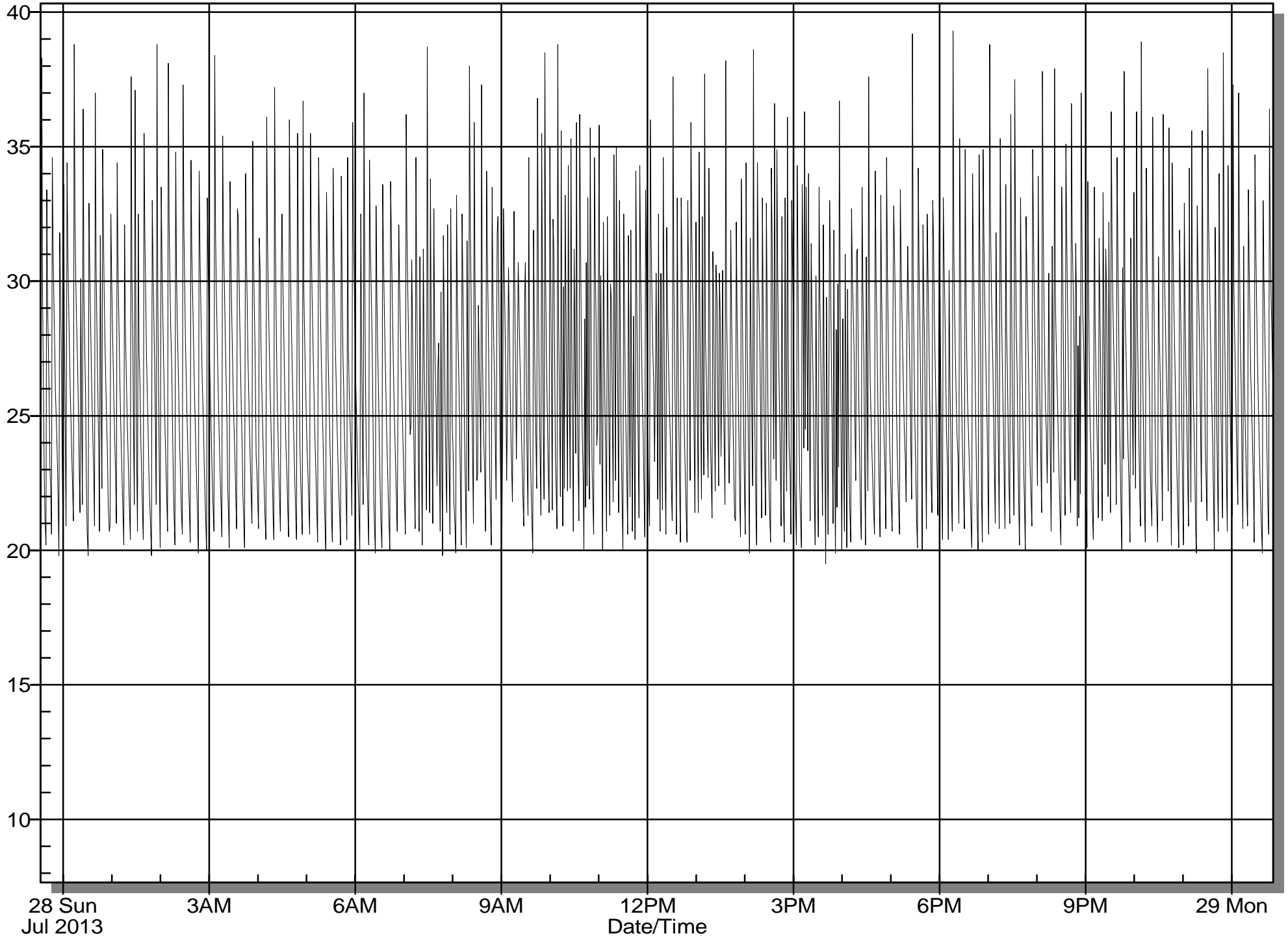
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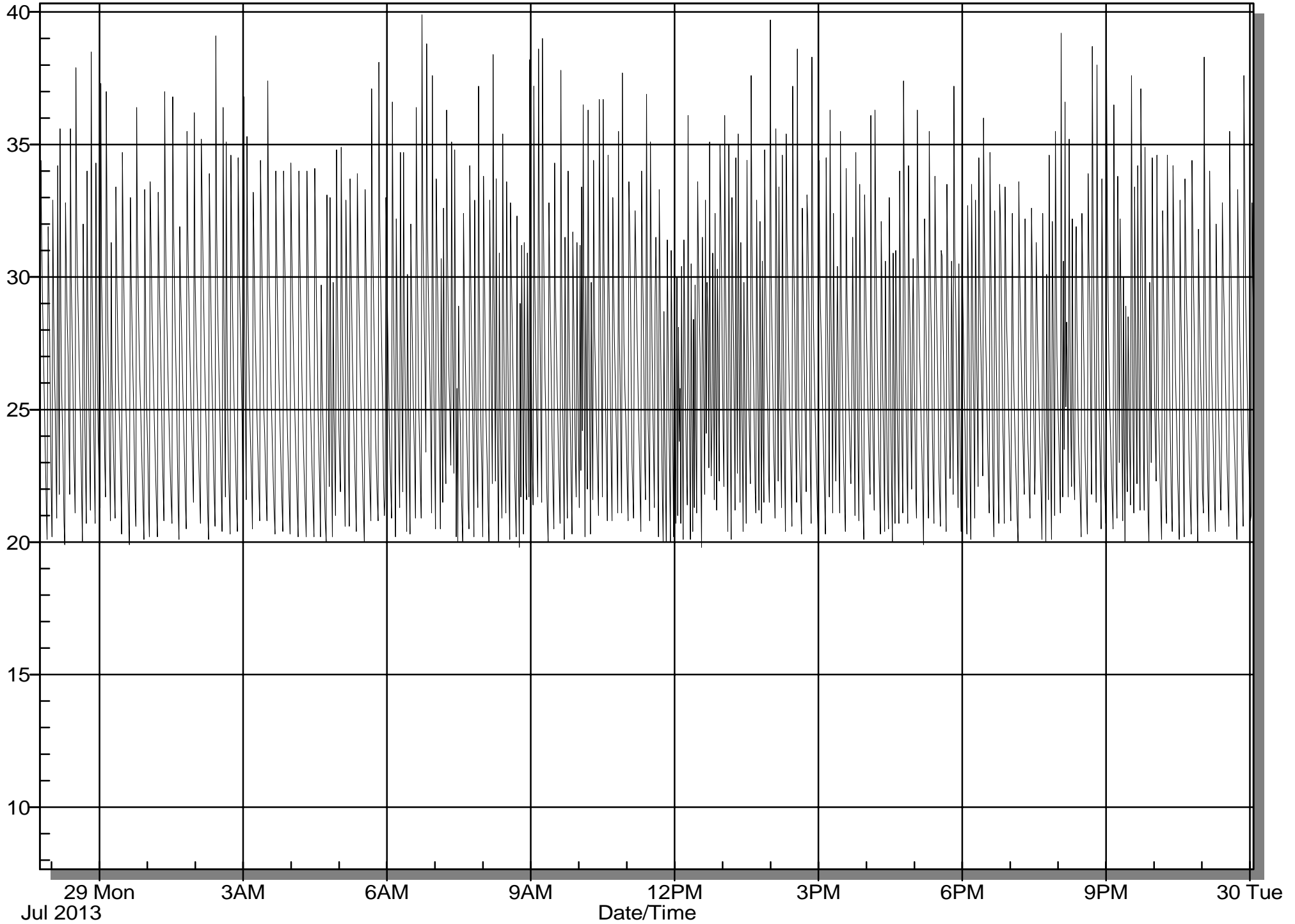
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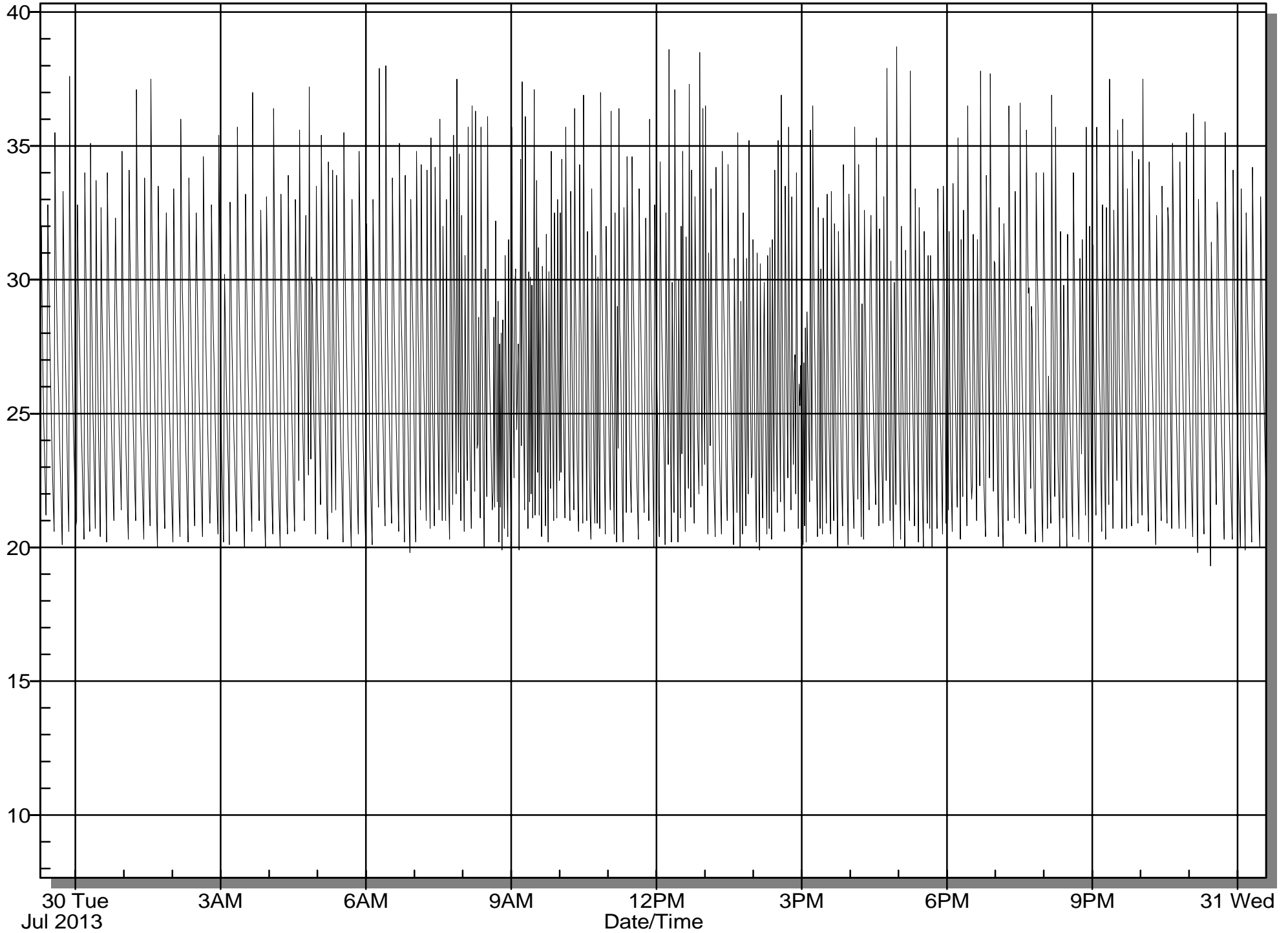
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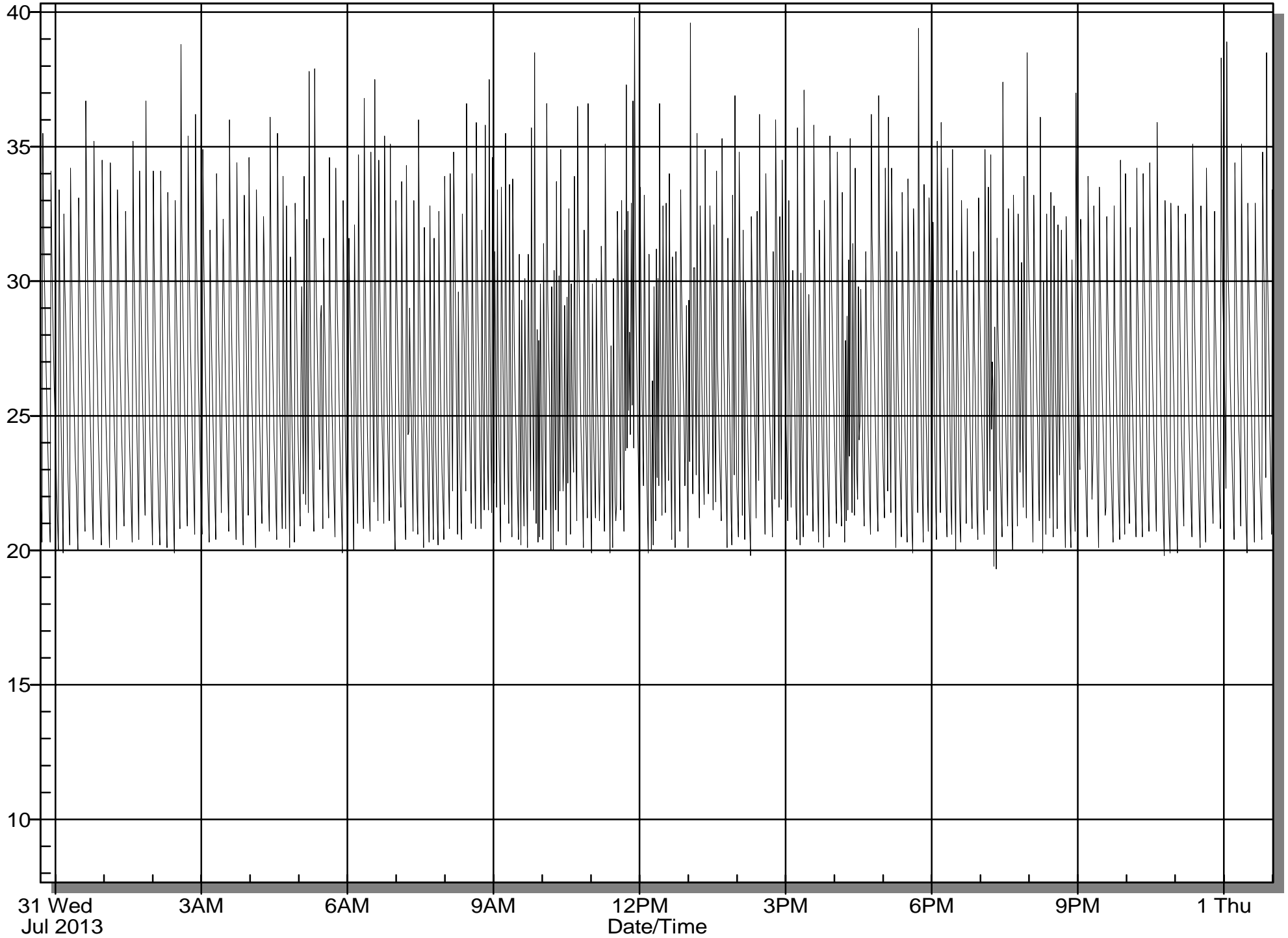
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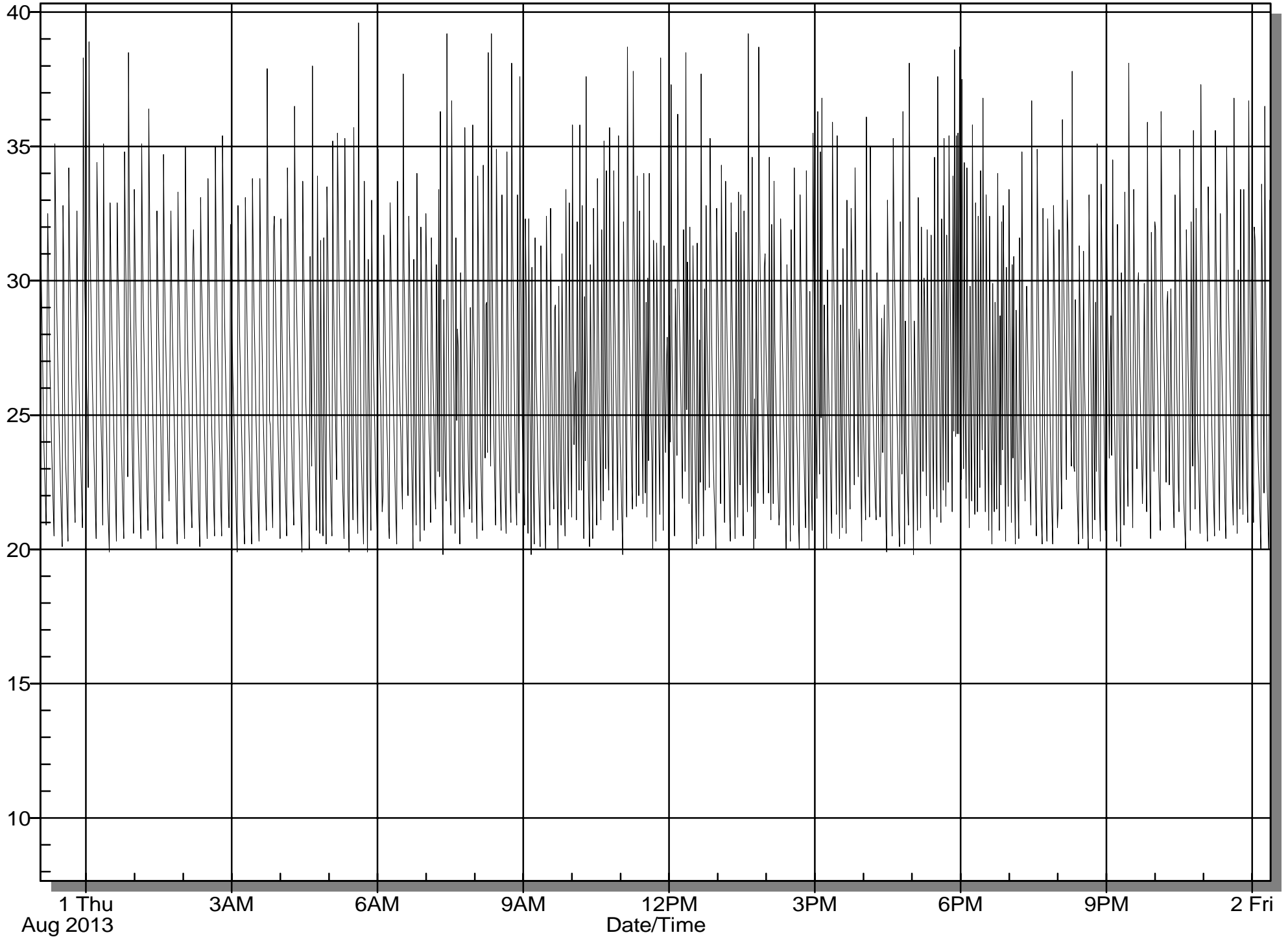
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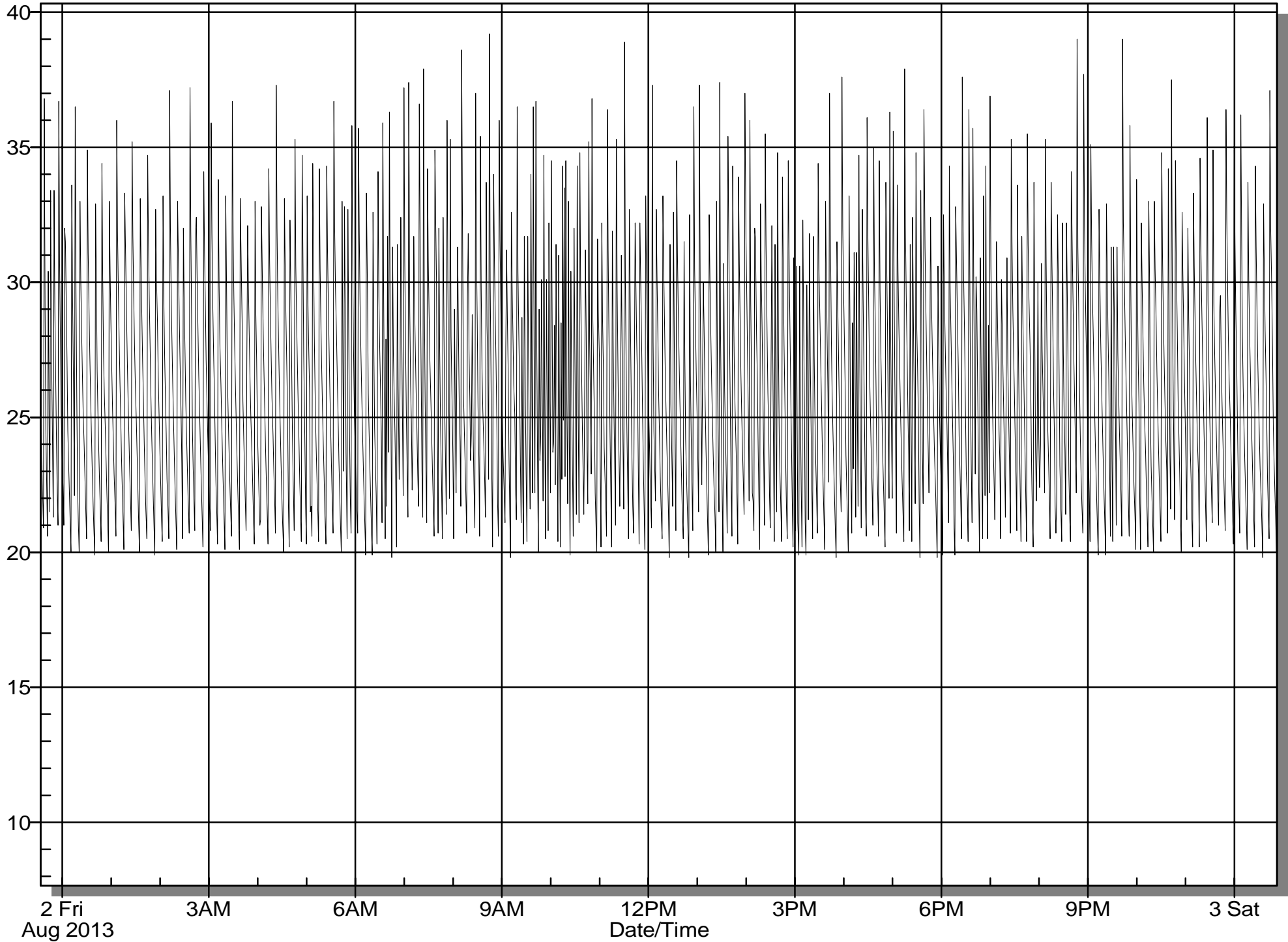
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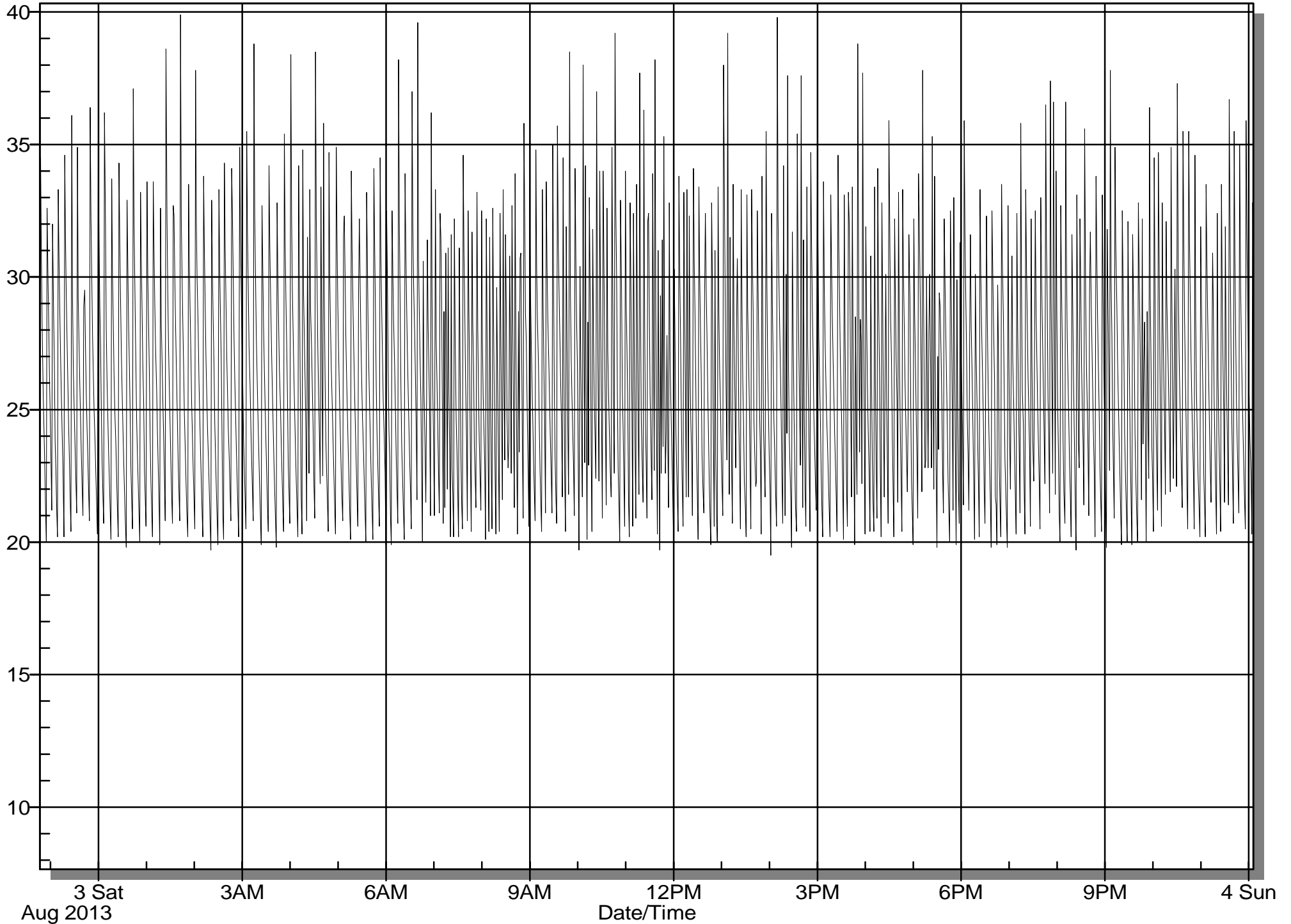
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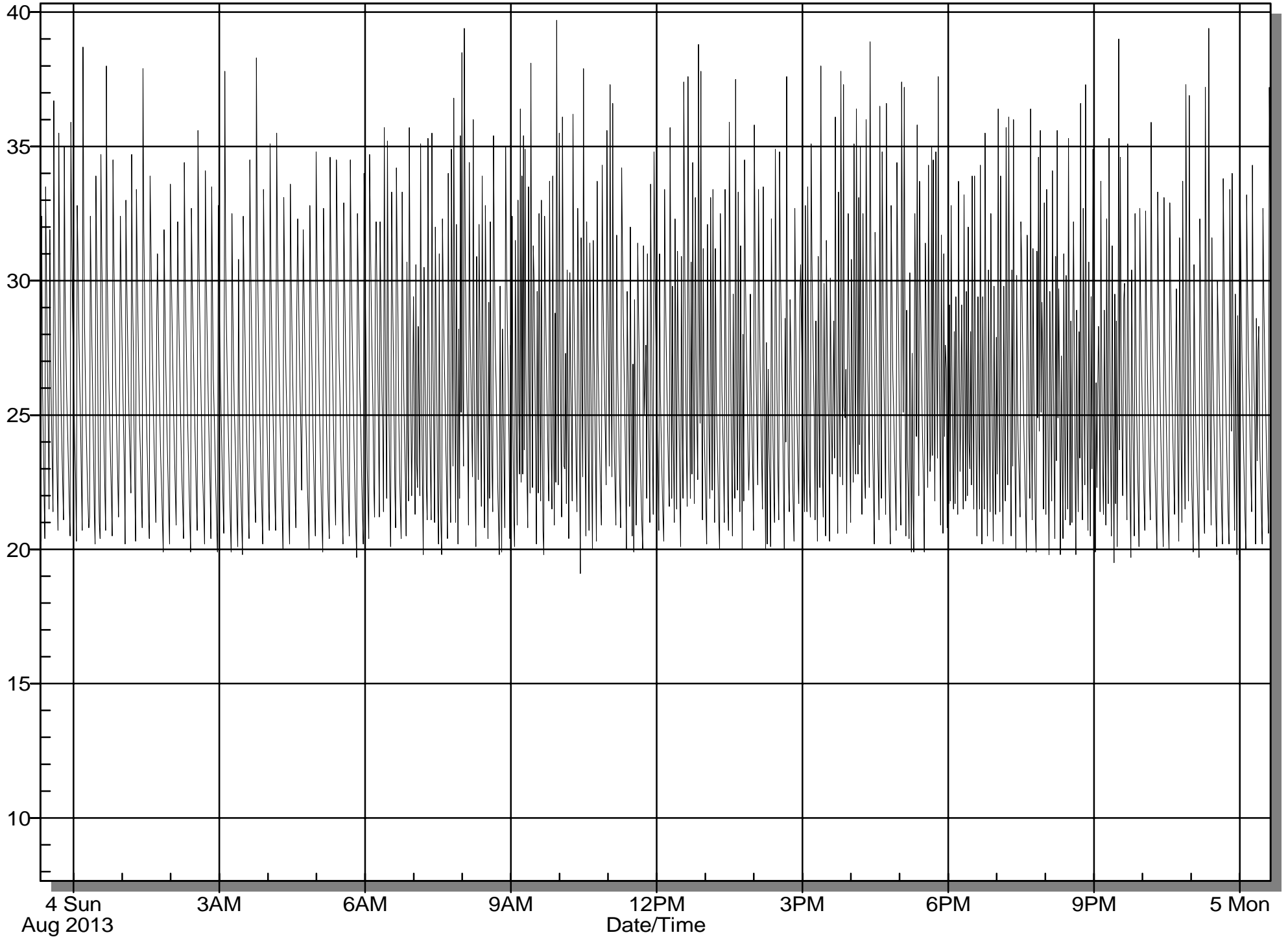
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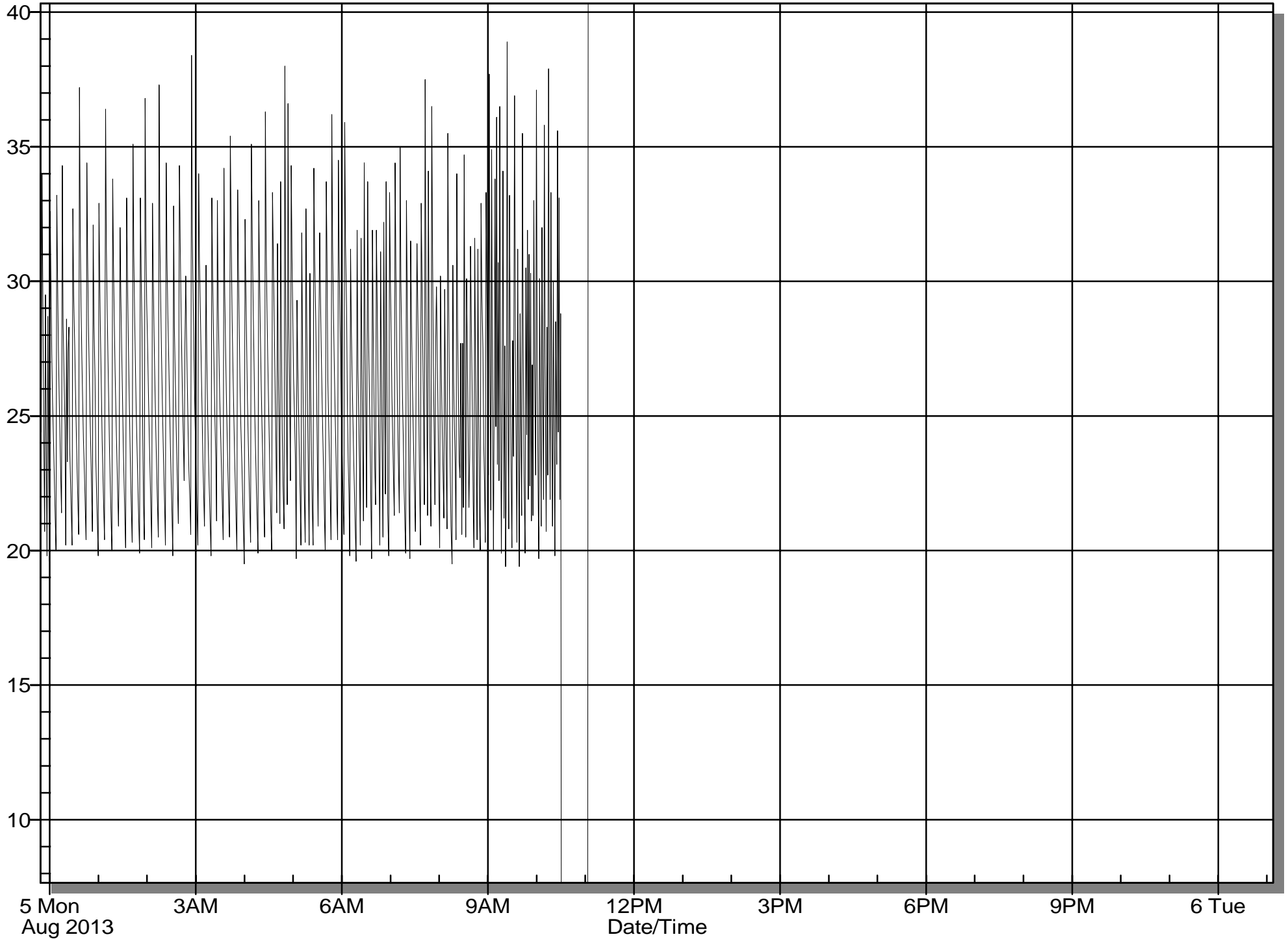
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(PR125 1)-Pressure/psig



15 Leonard Drive

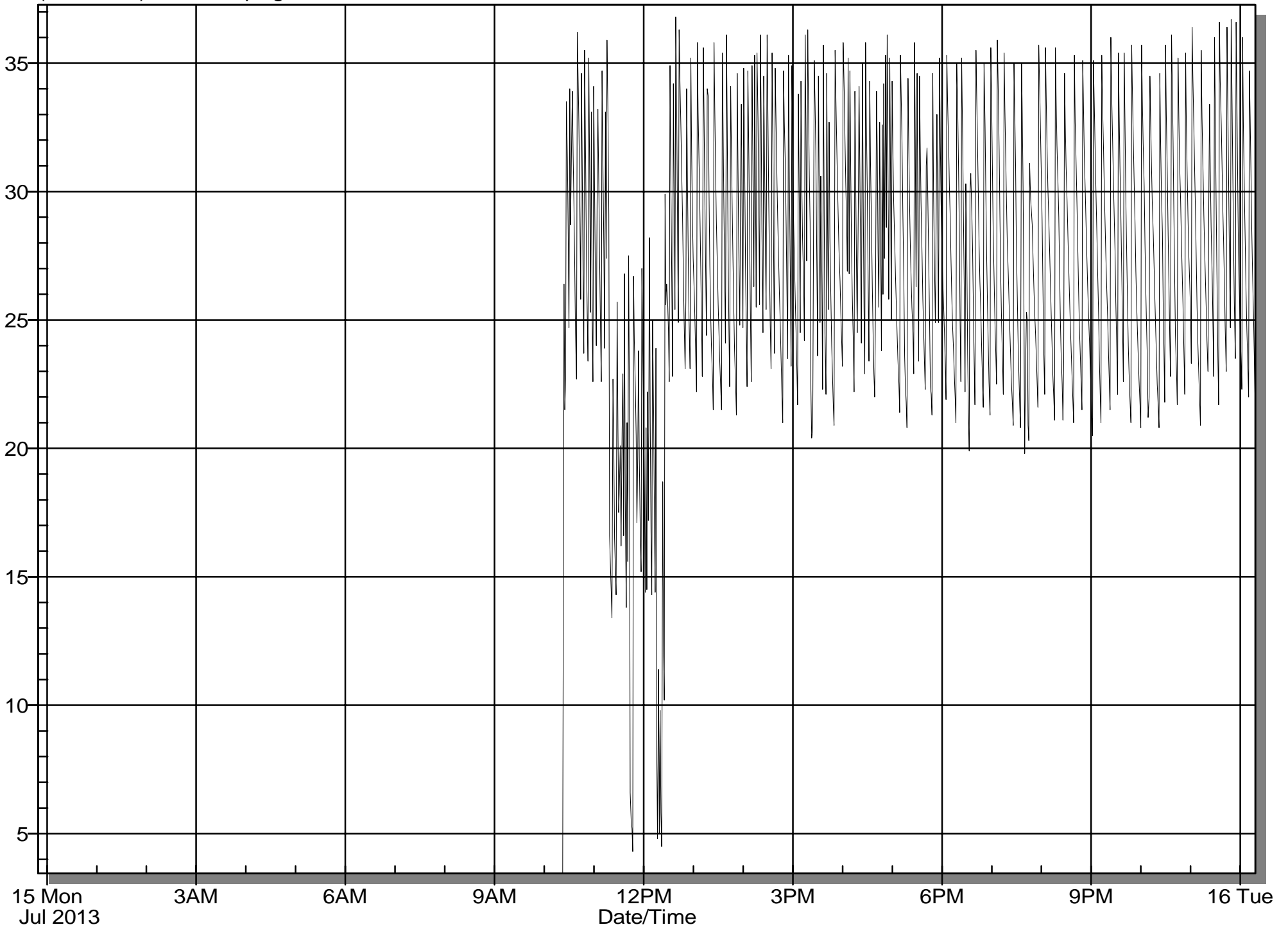
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6 Leonard Drive

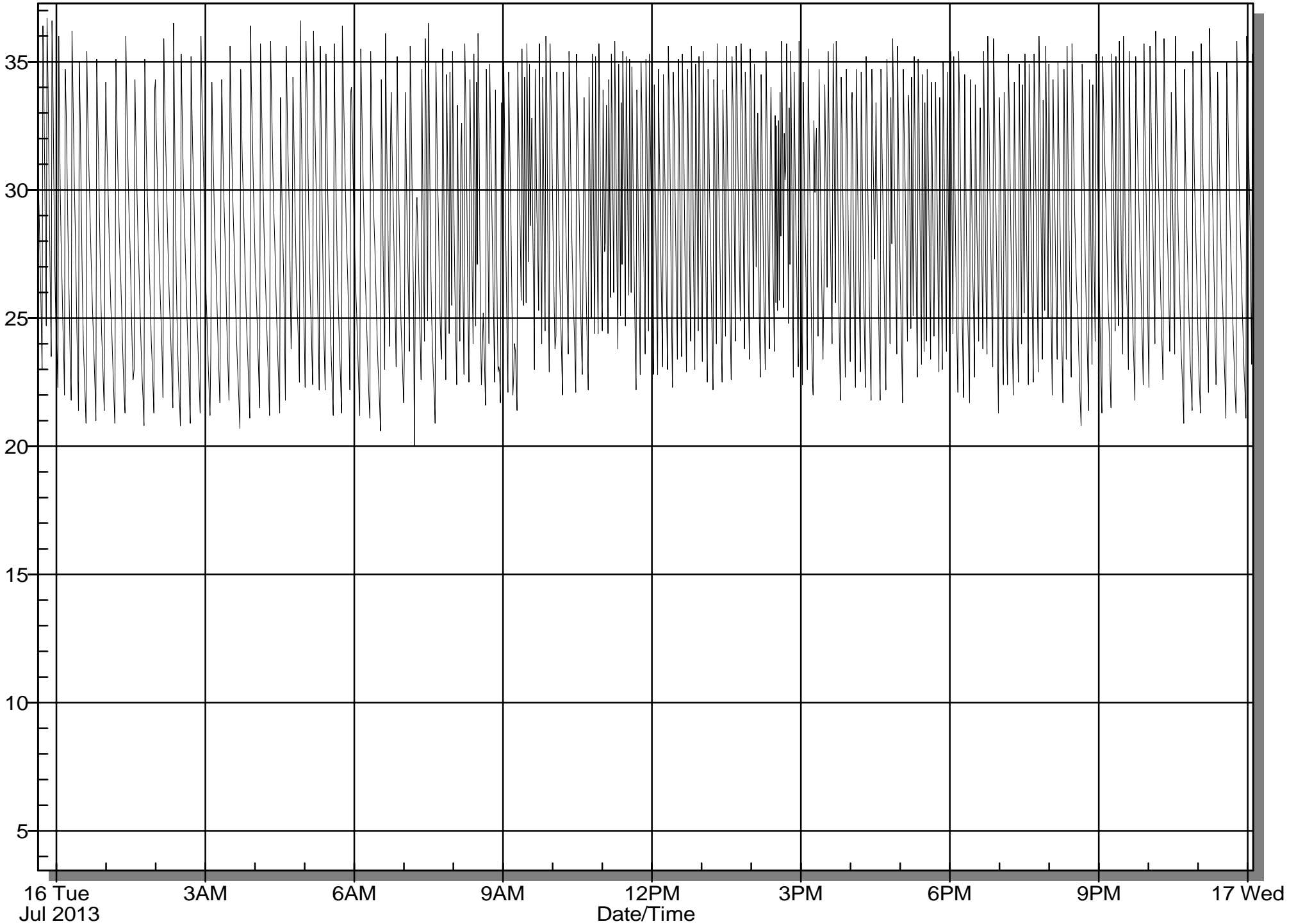
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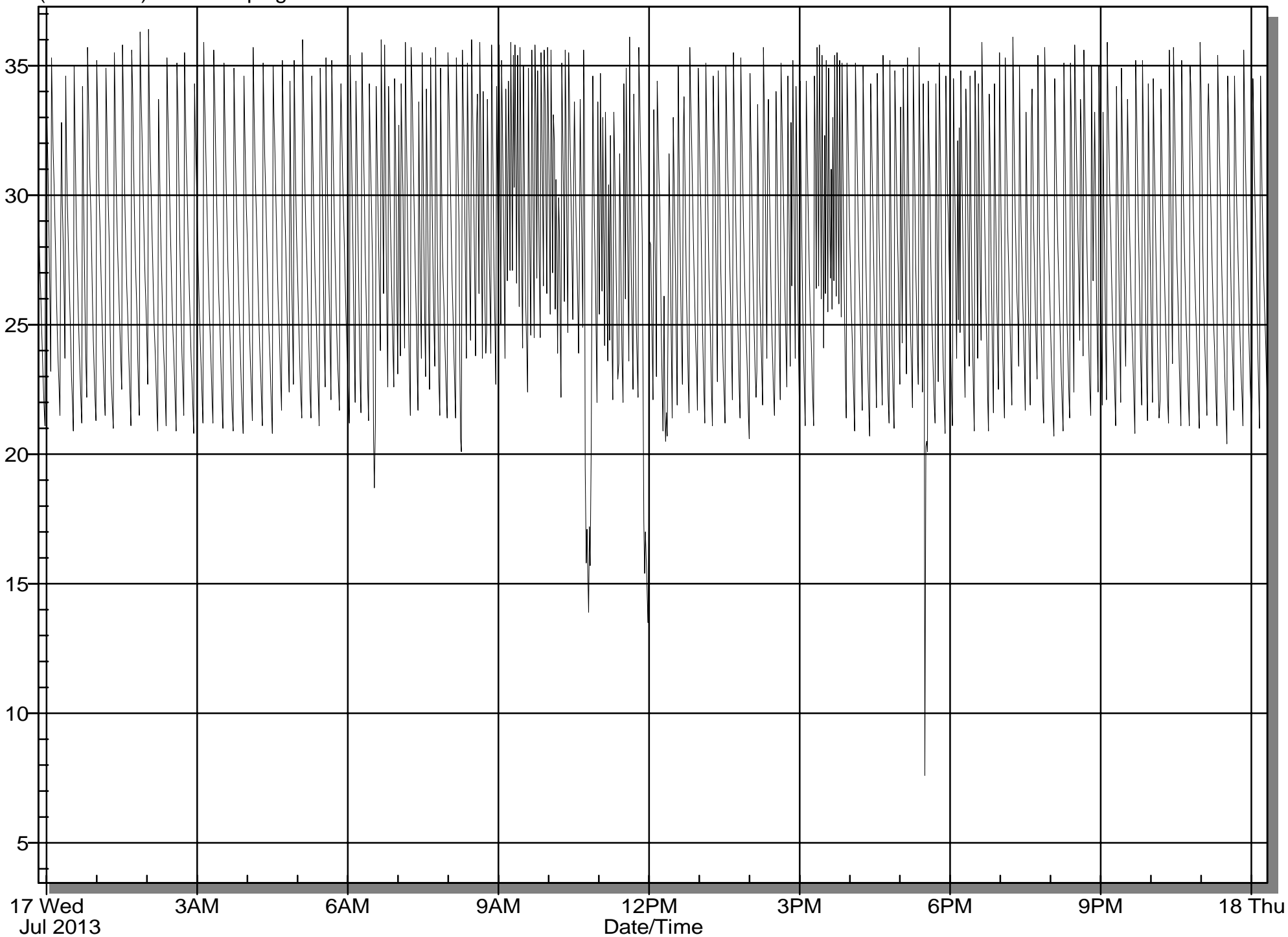
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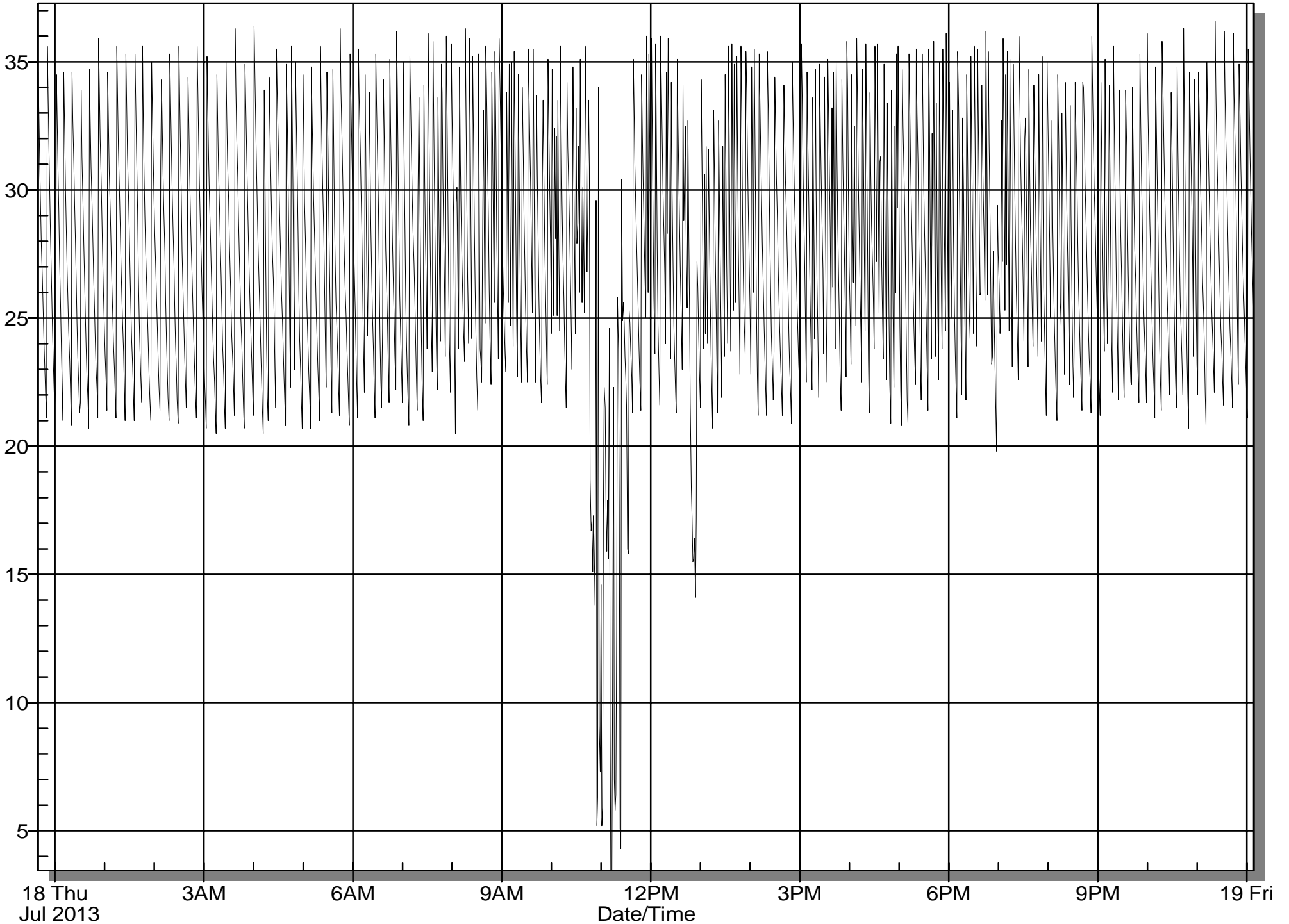
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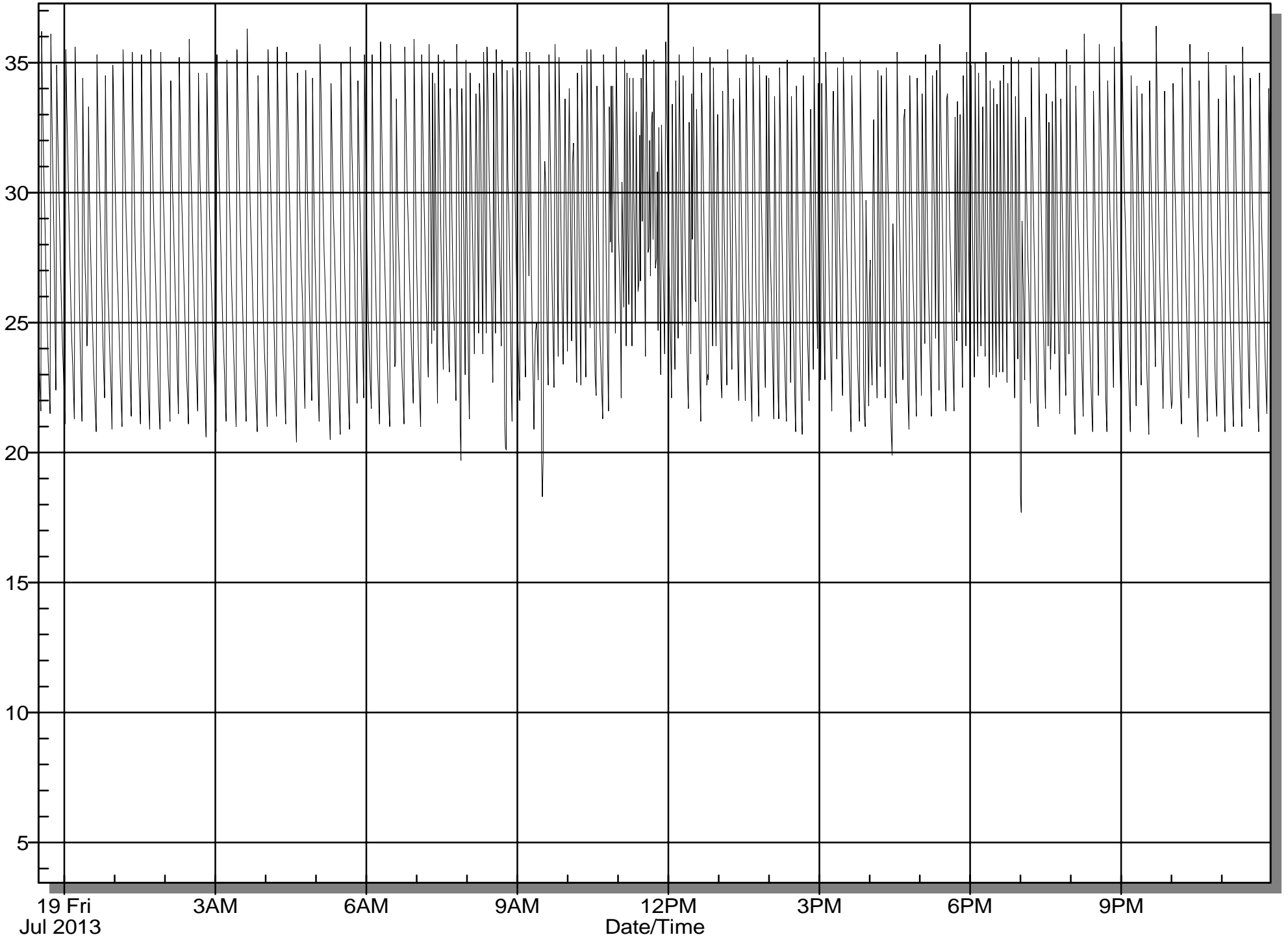
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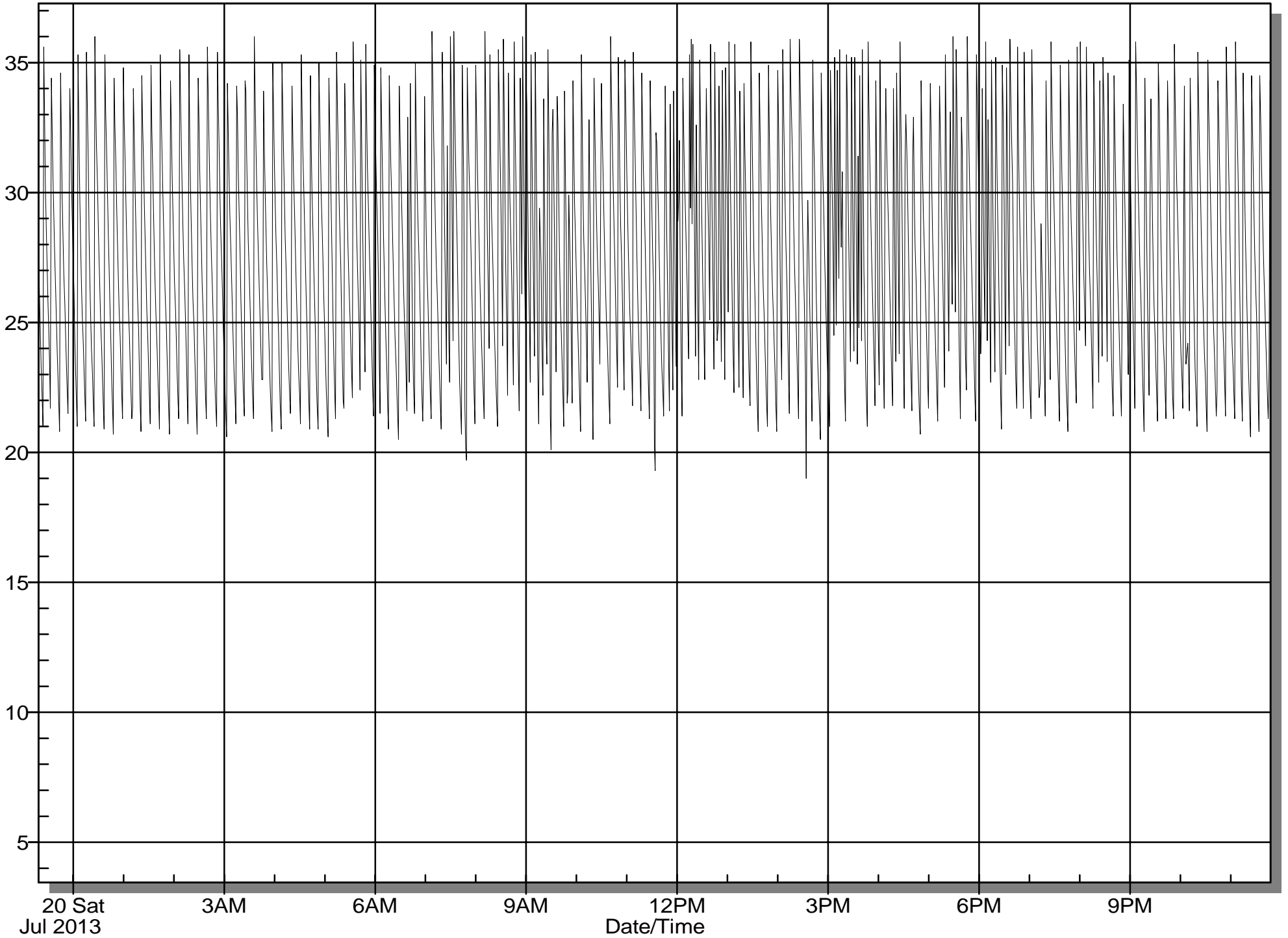
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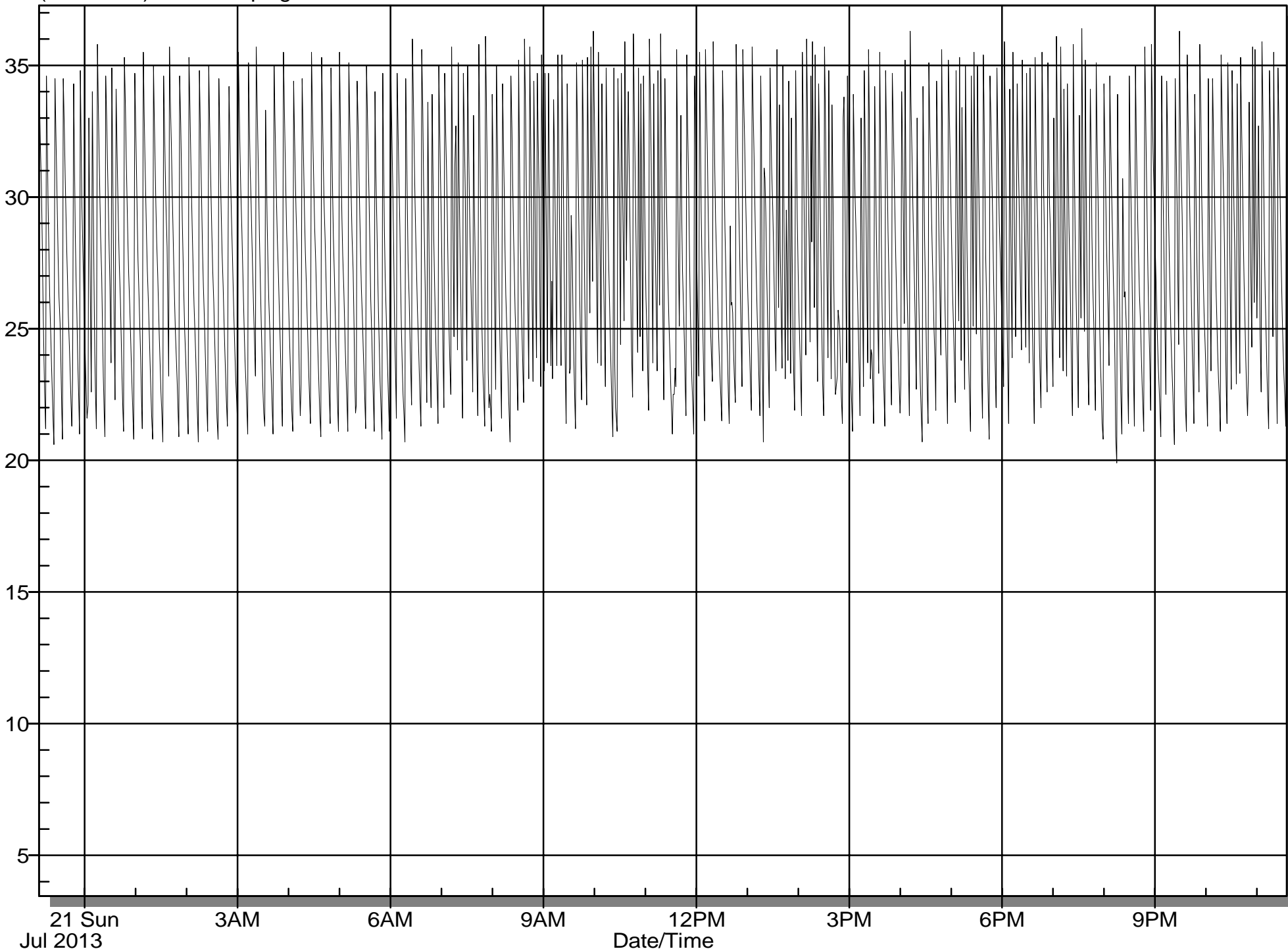
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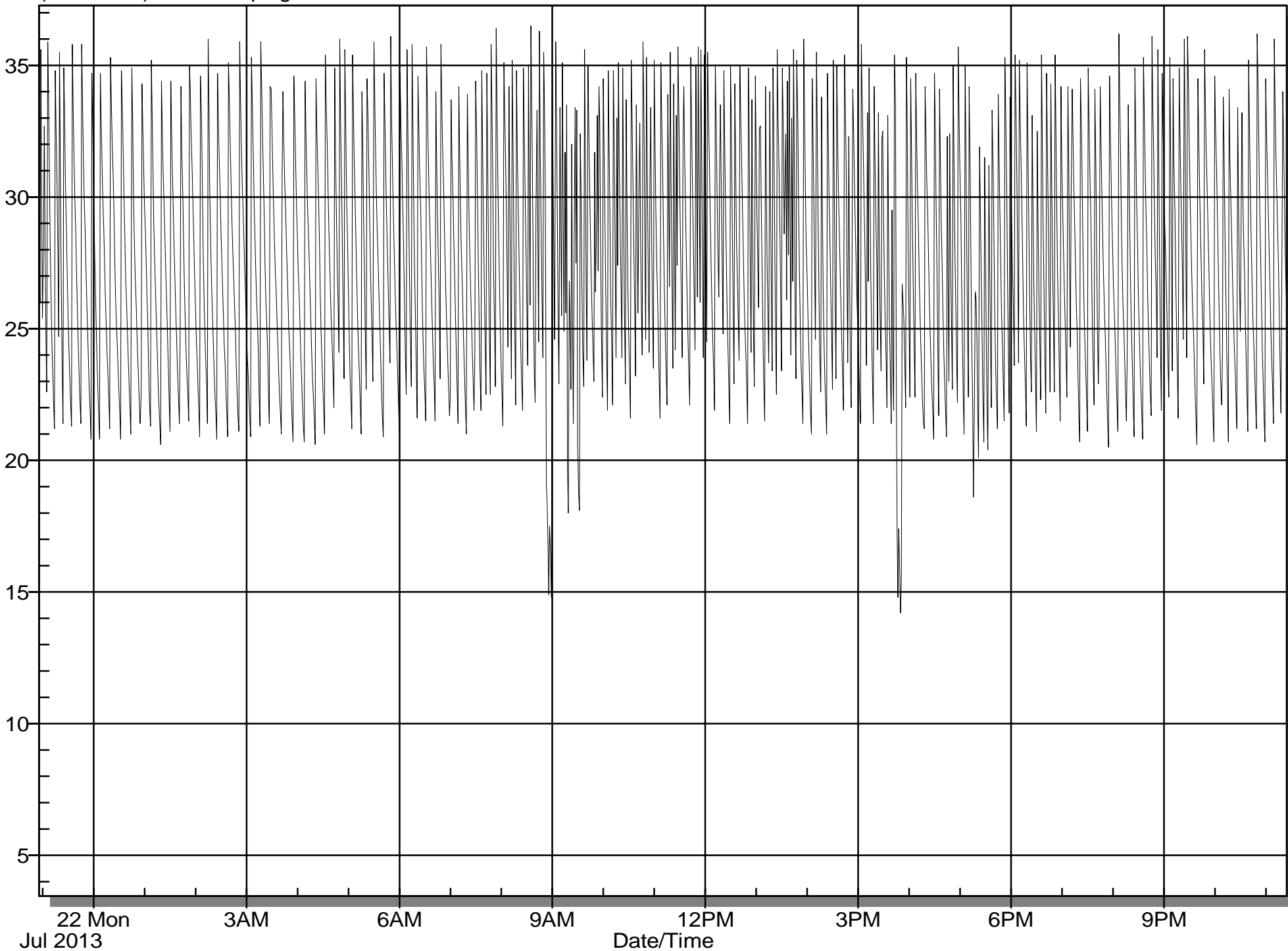
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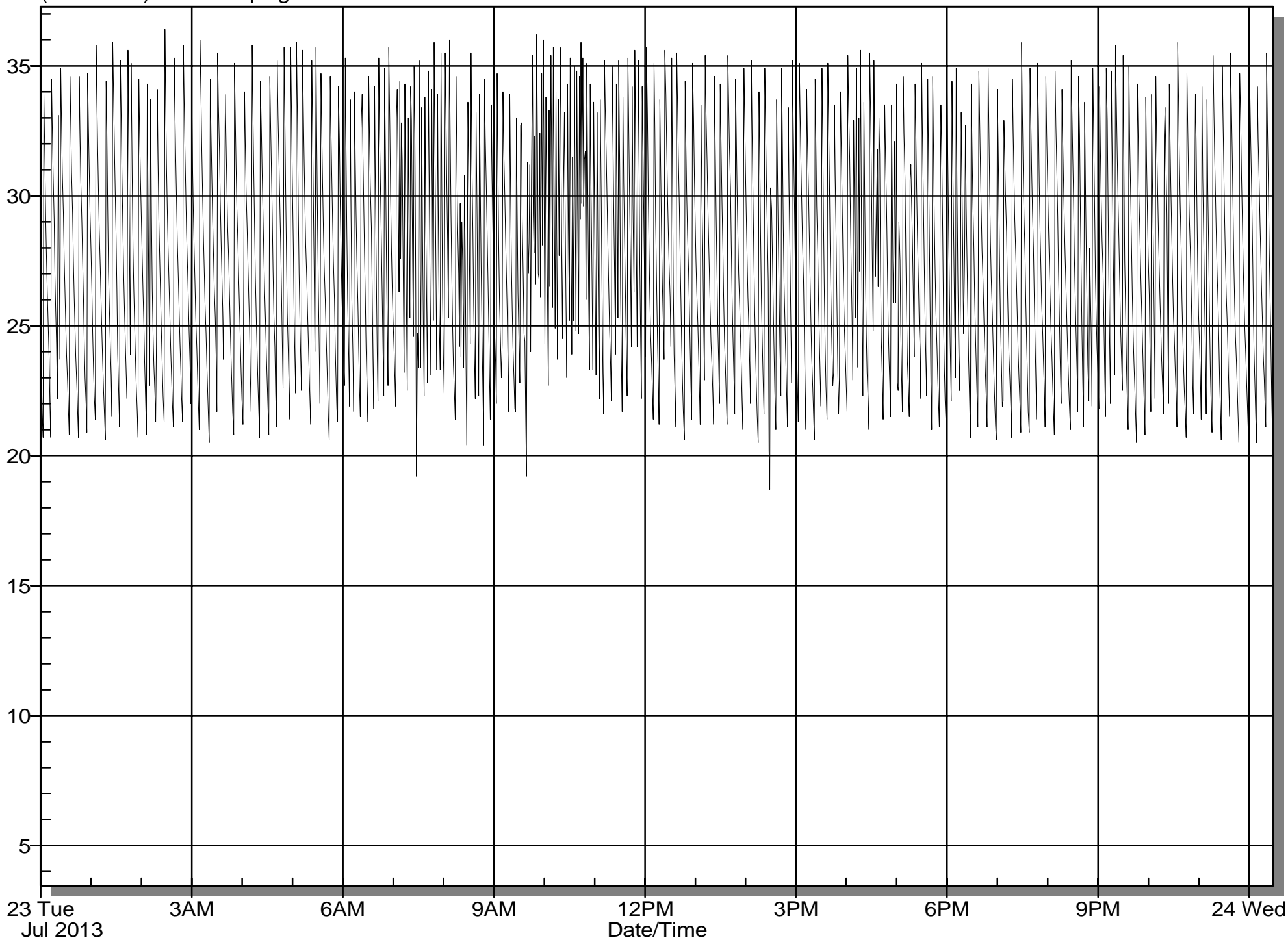
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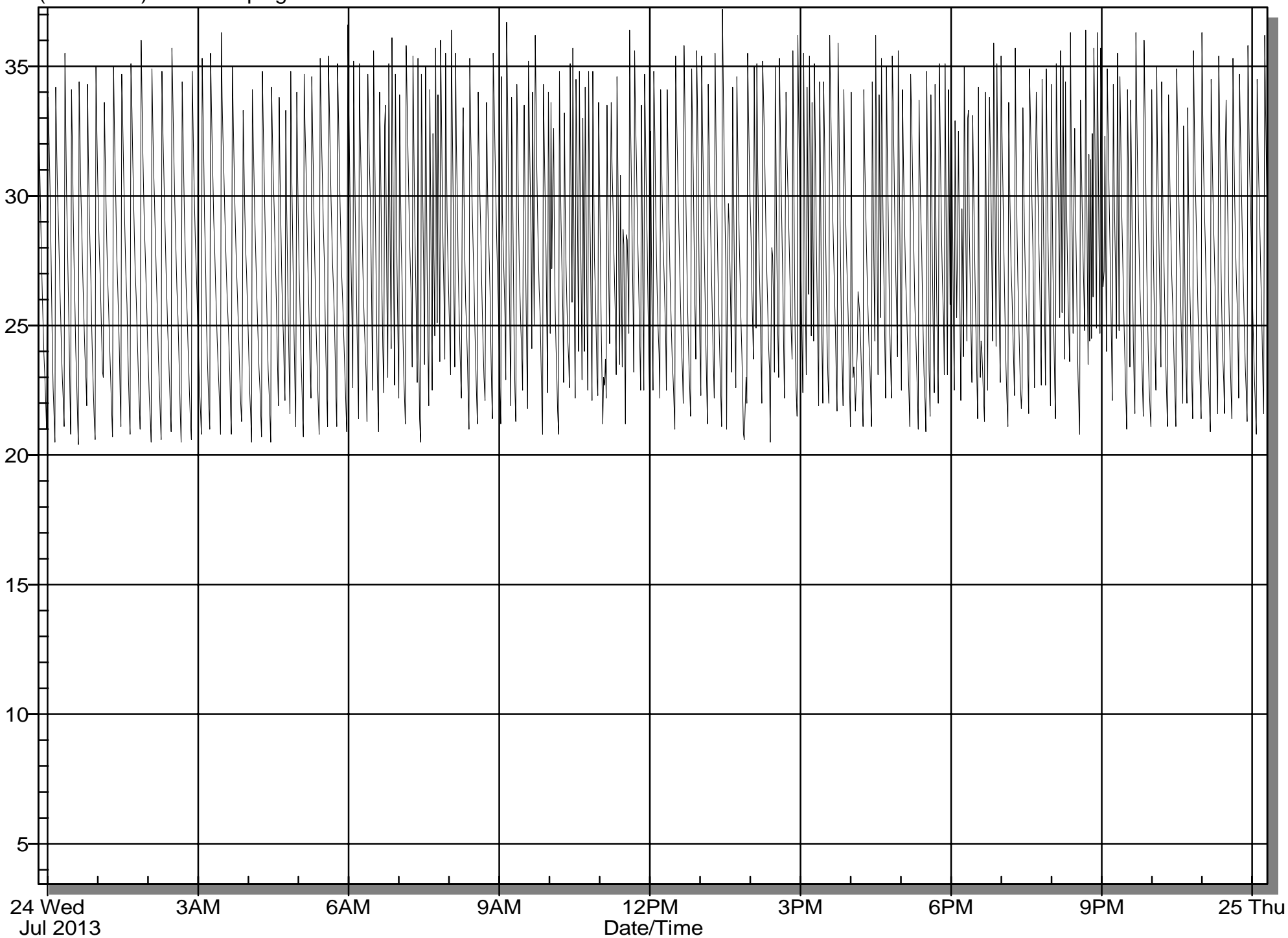
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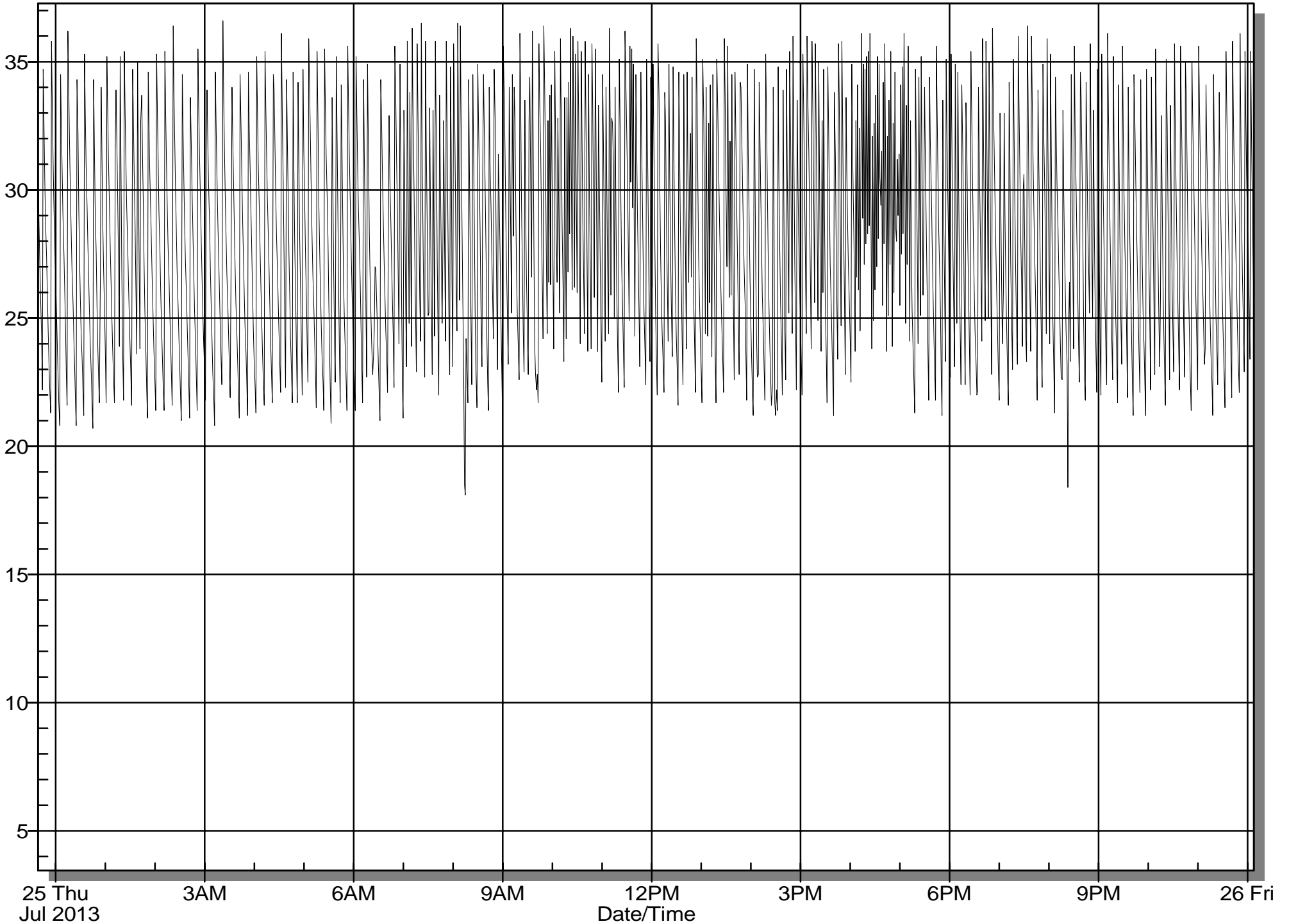
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(PR125 2)-Pressure/psig



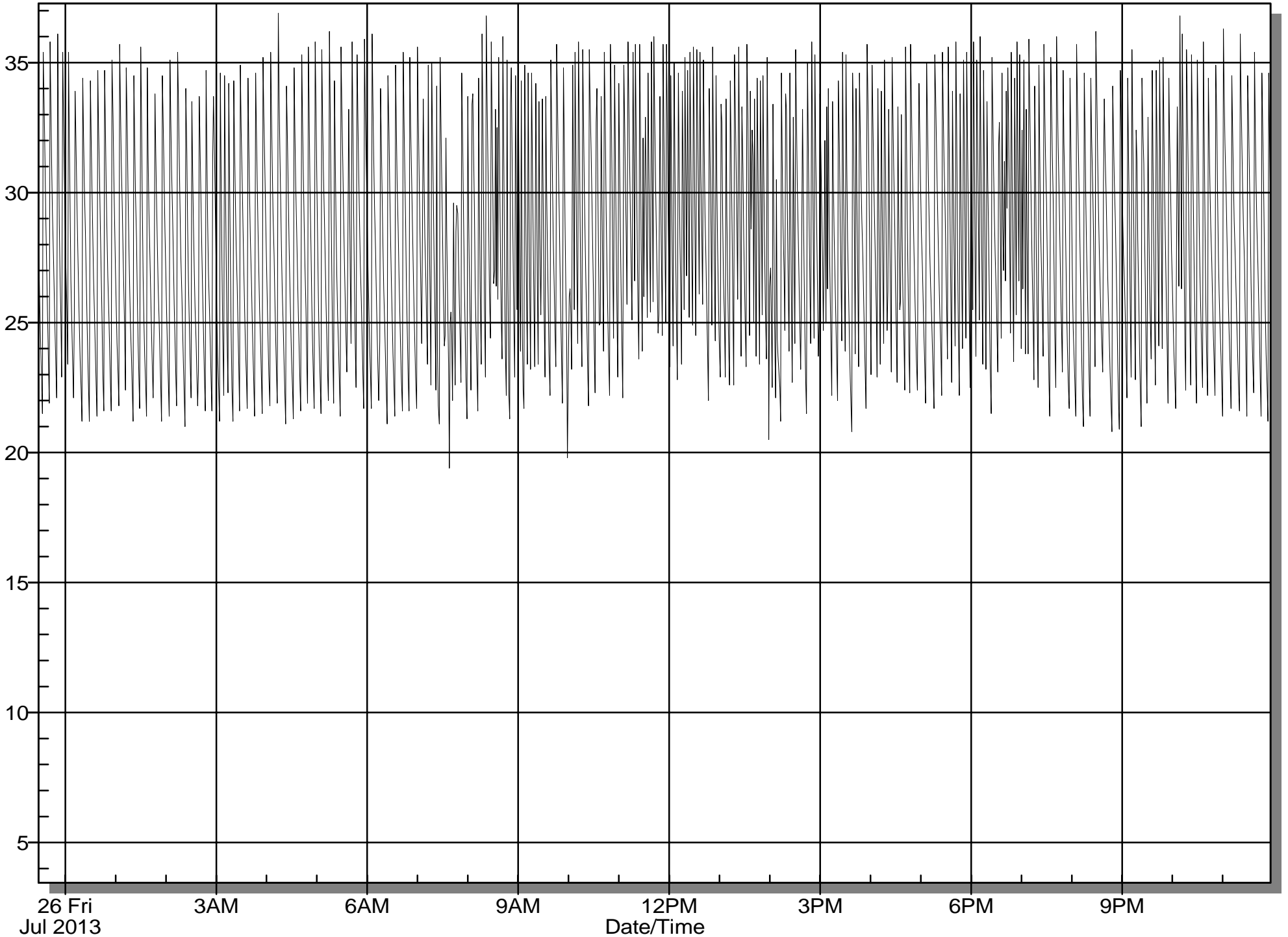
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(PR125 2)-Pressure/psig



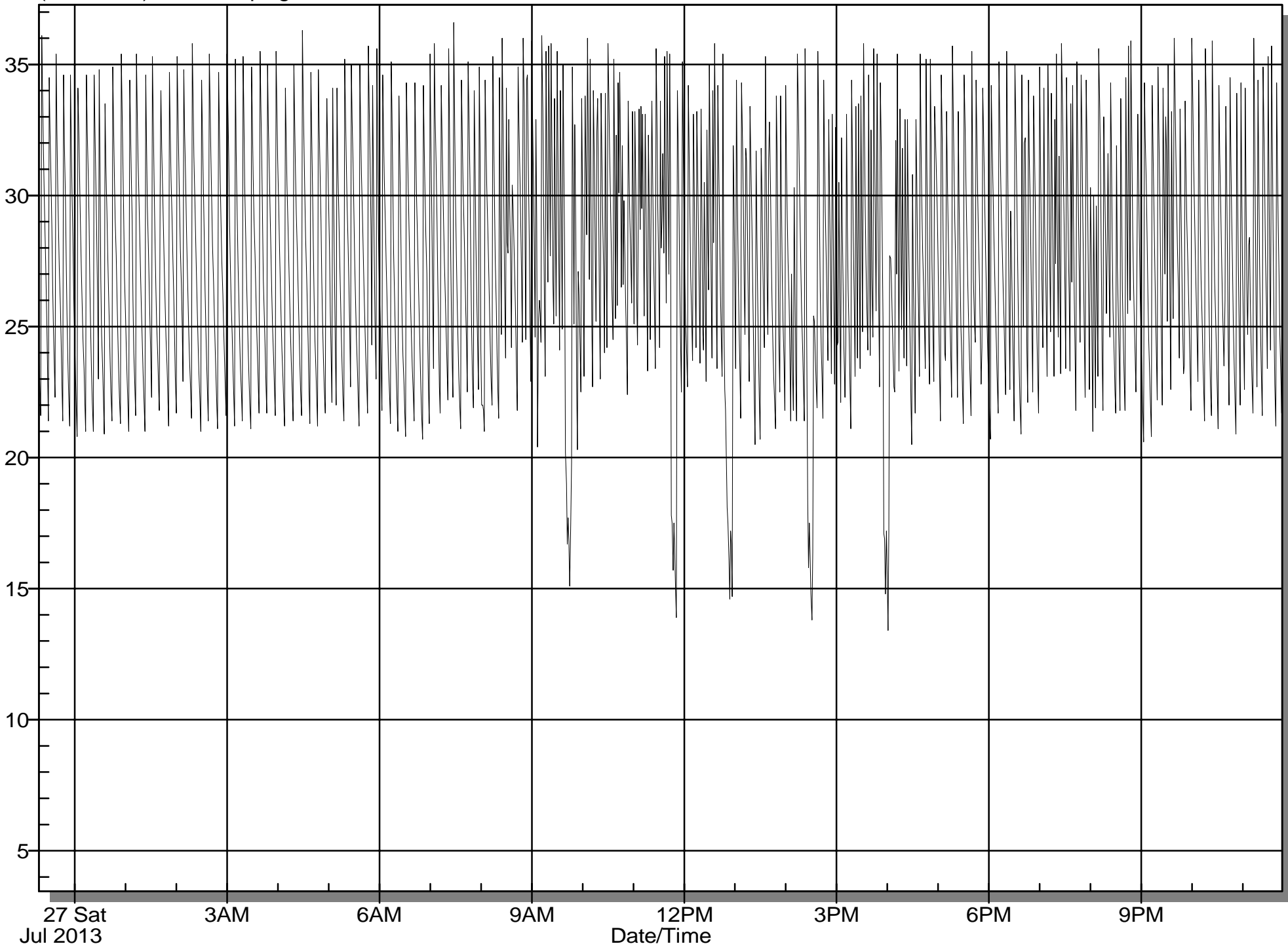
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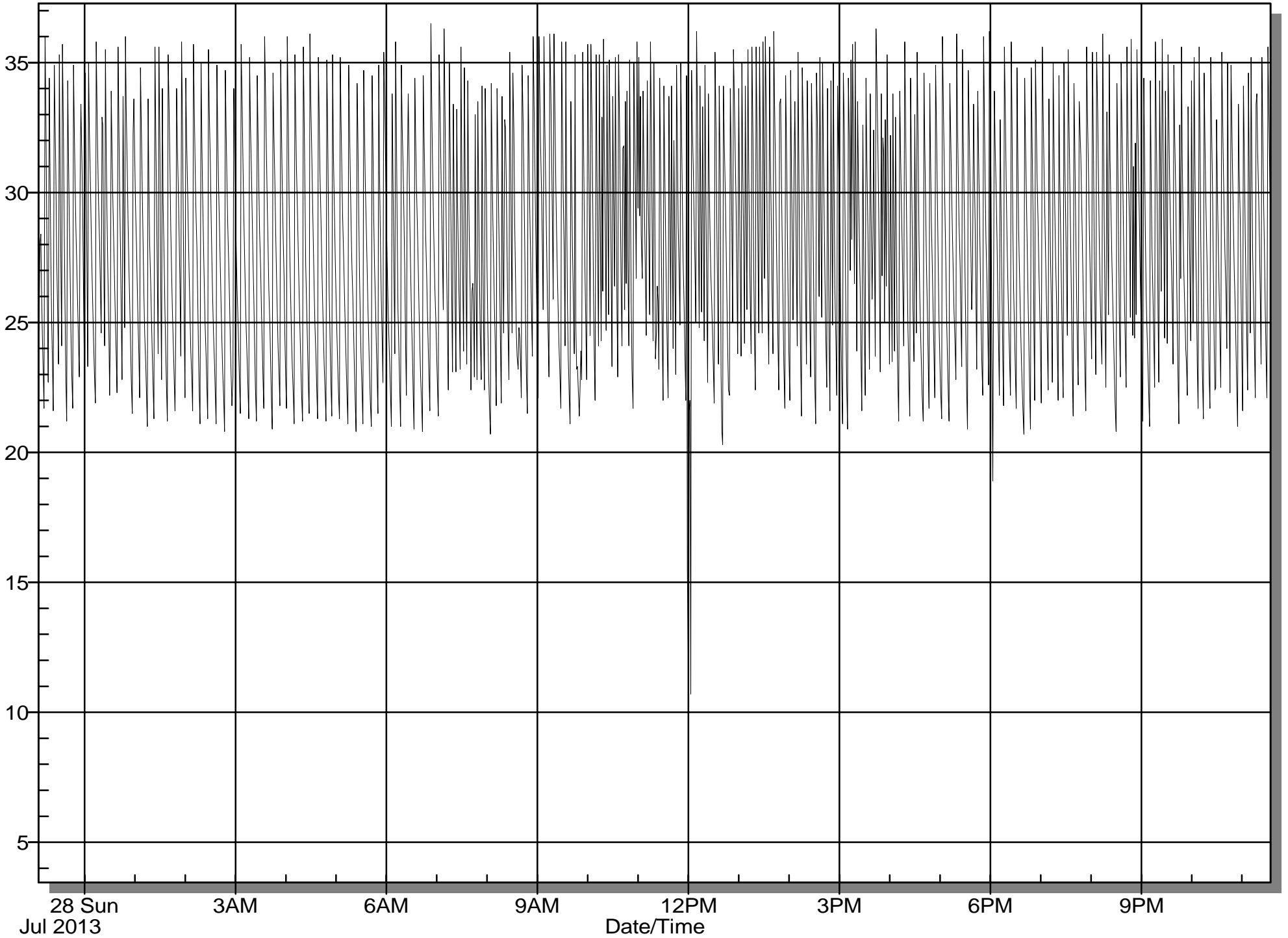
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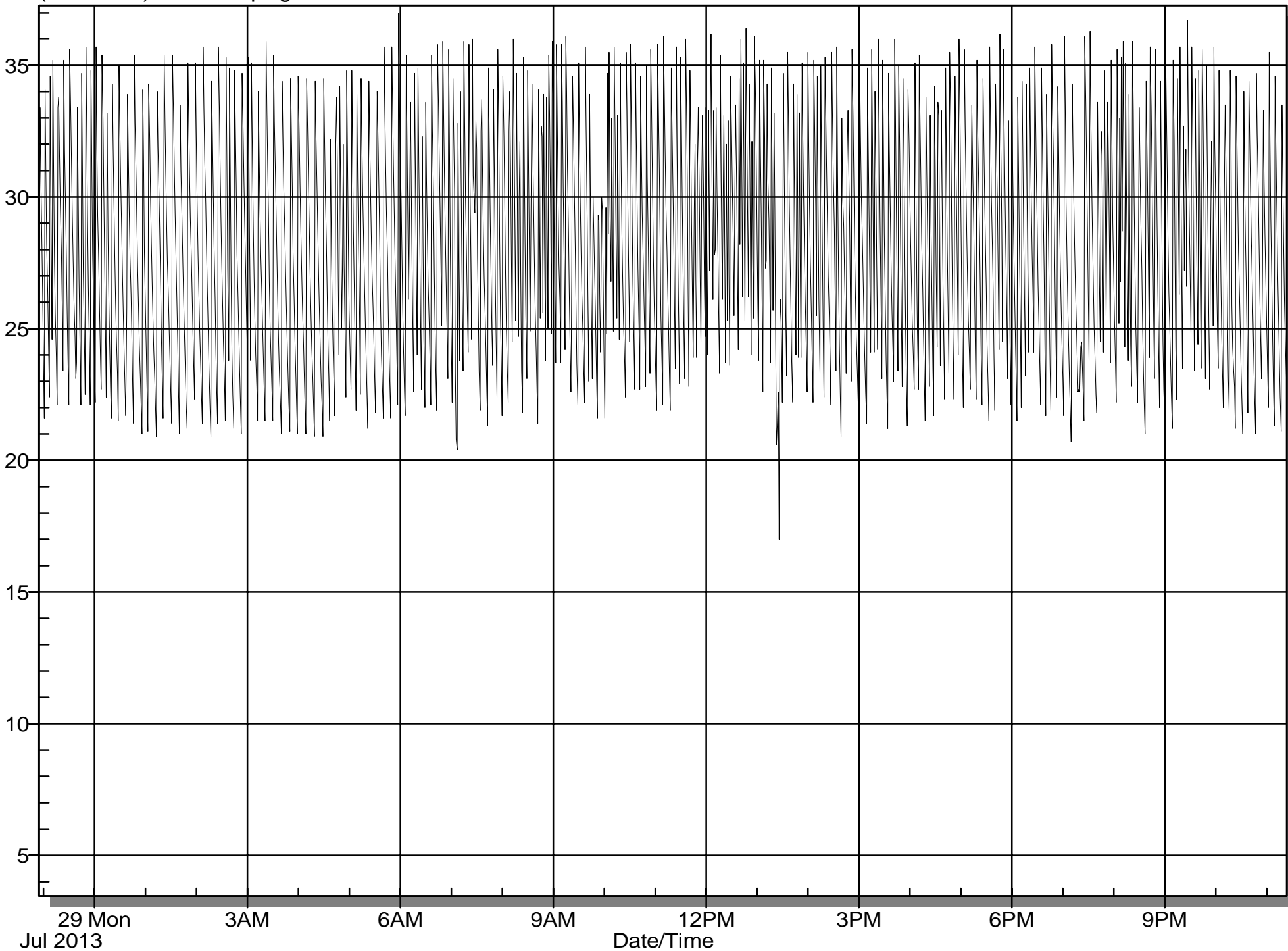
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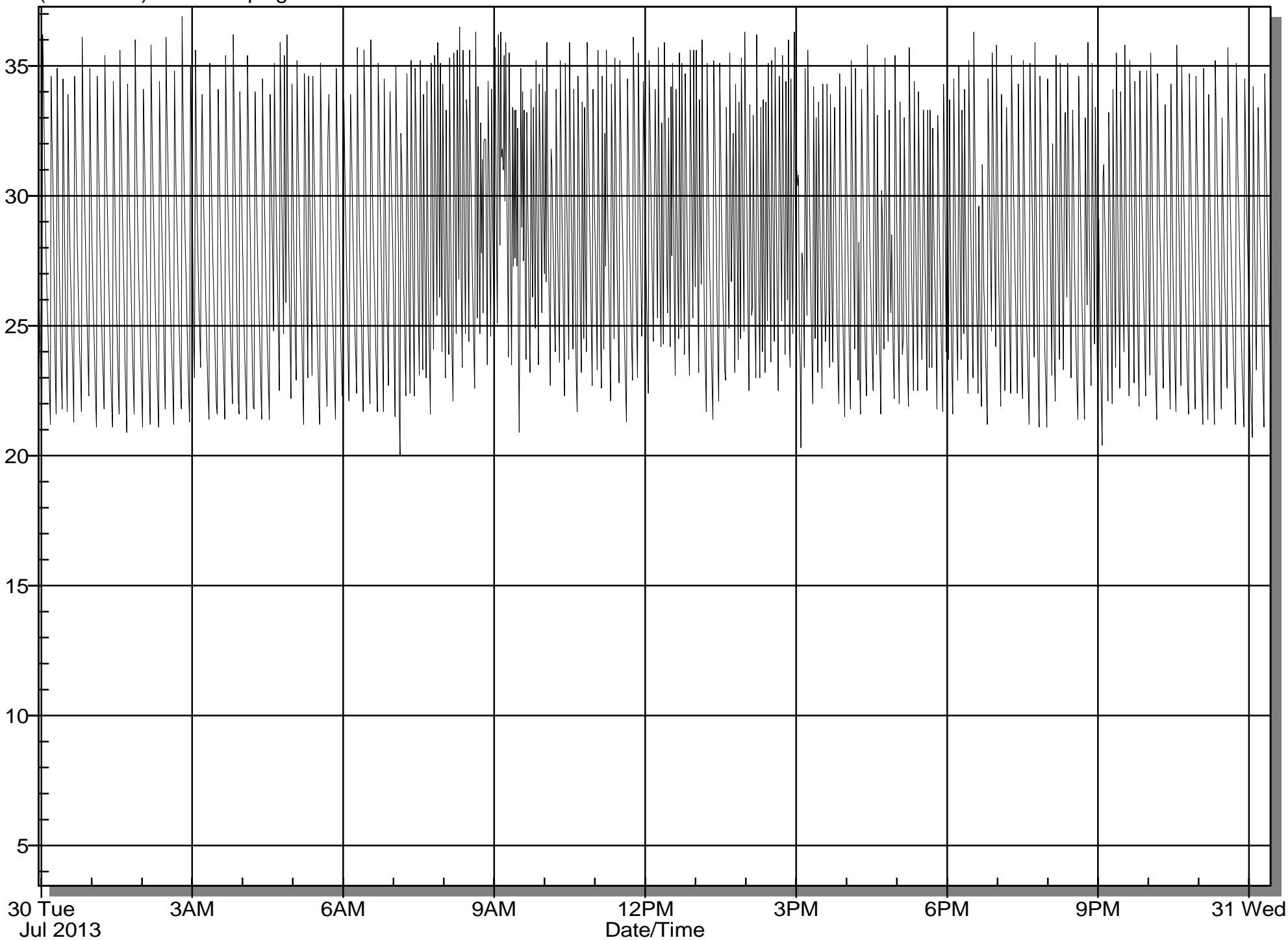
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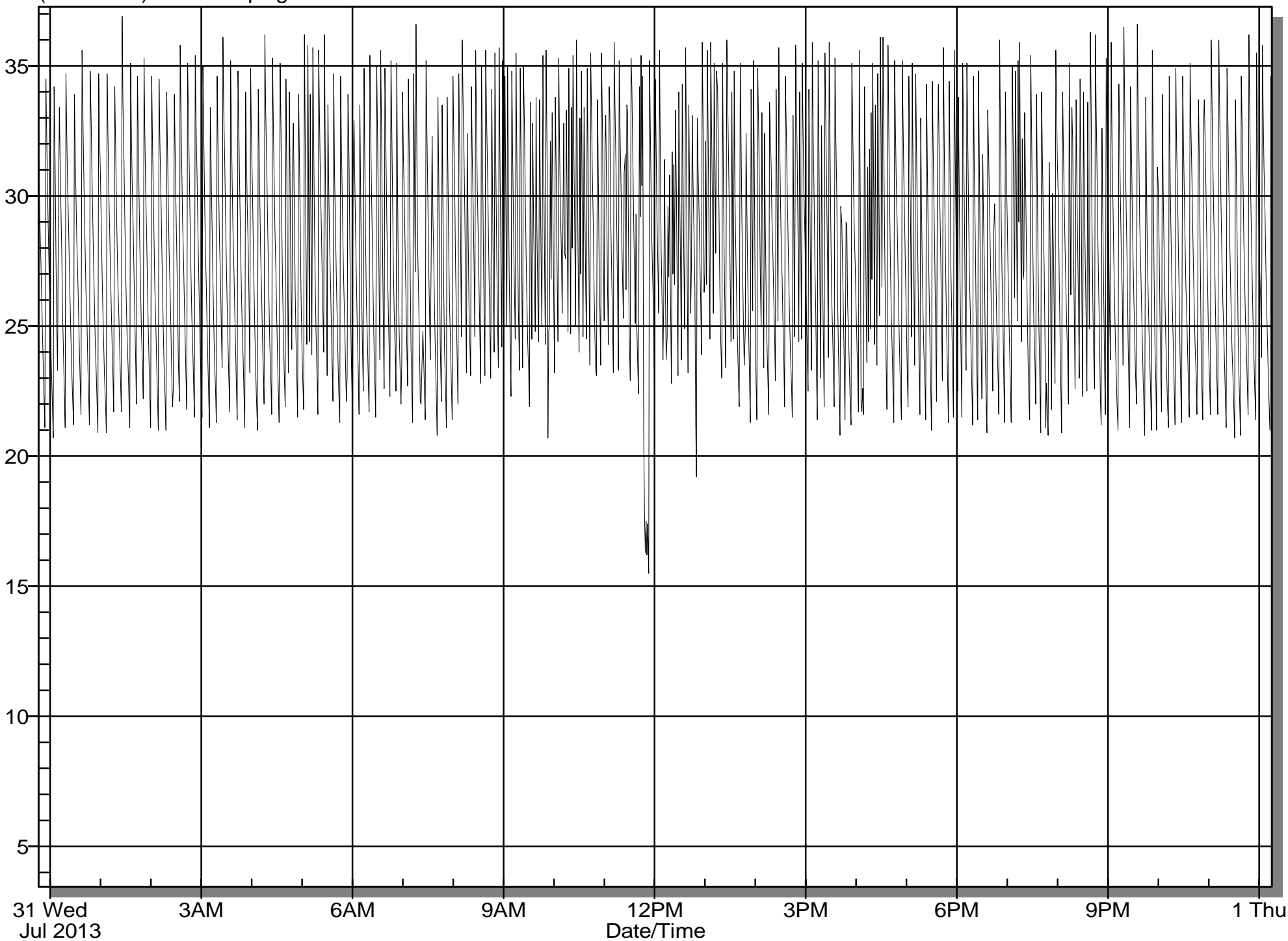
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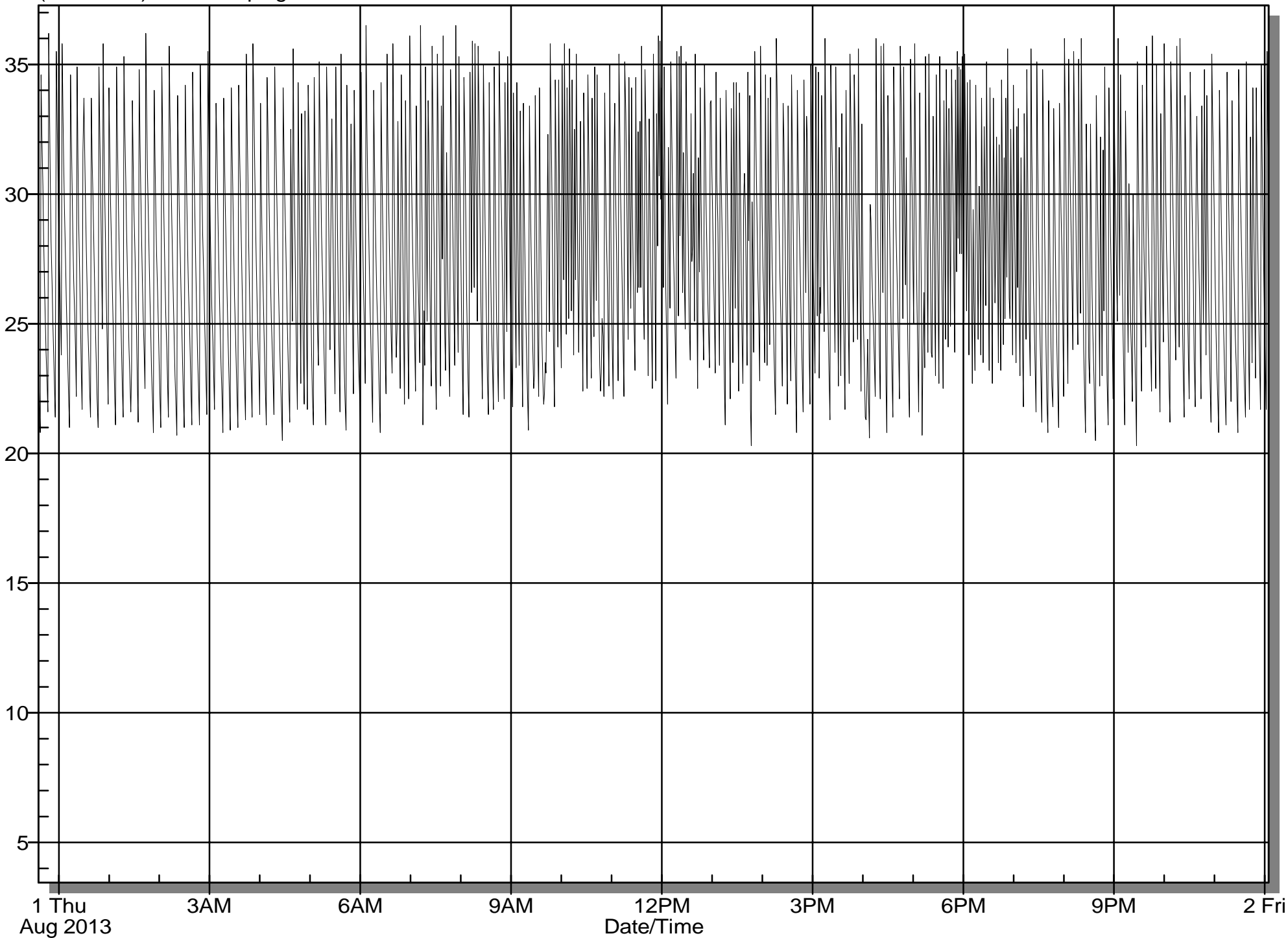
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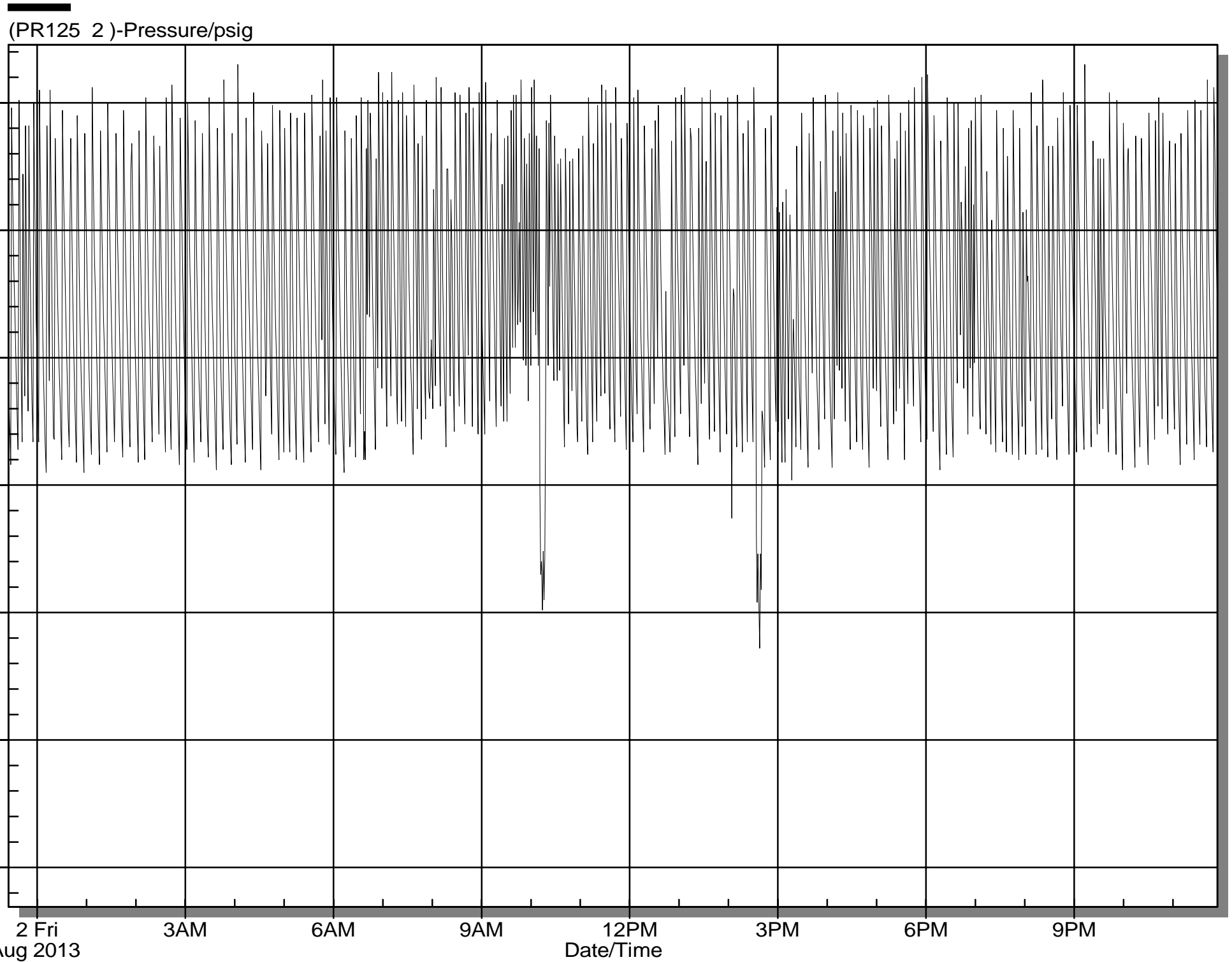


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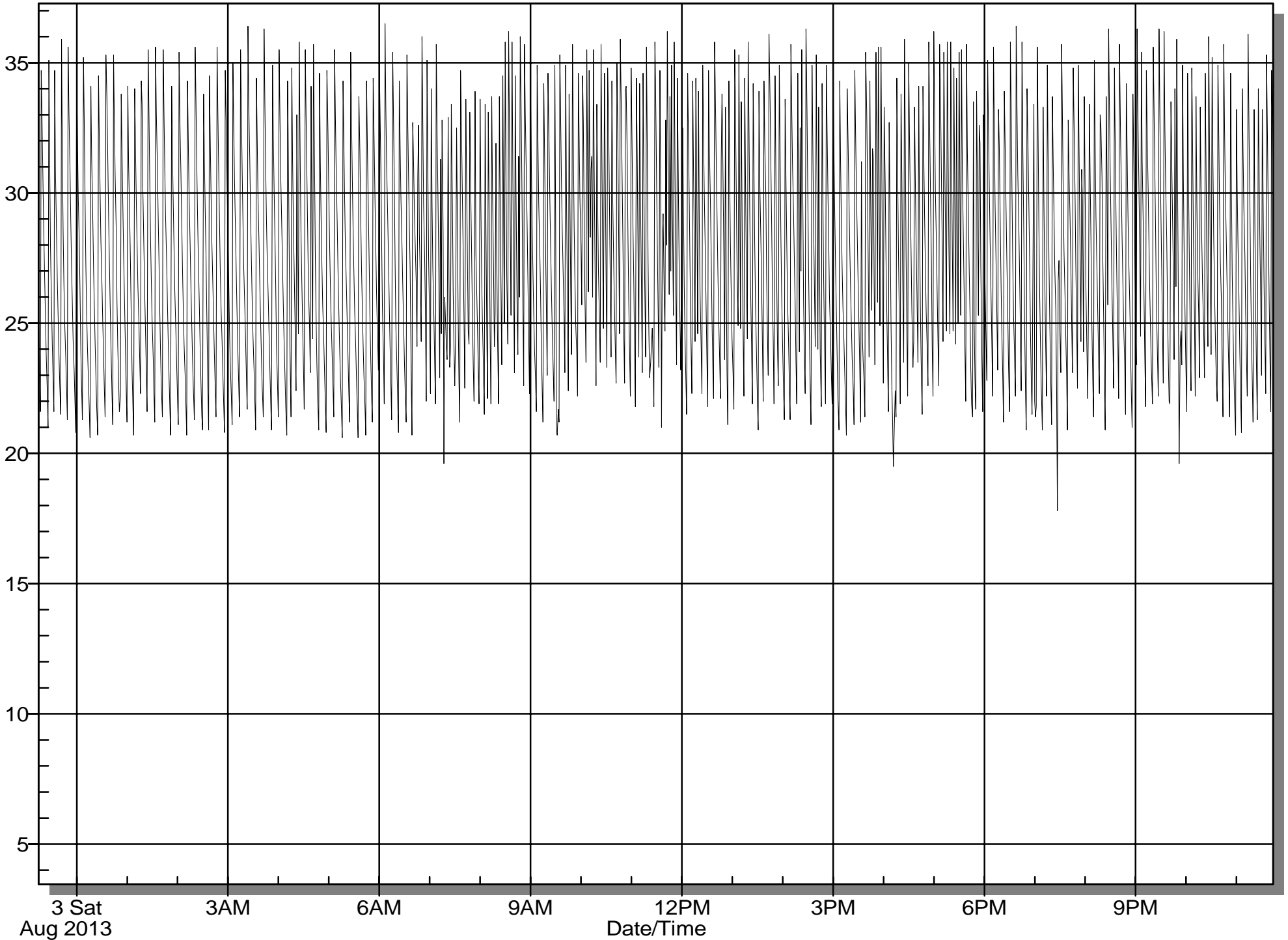


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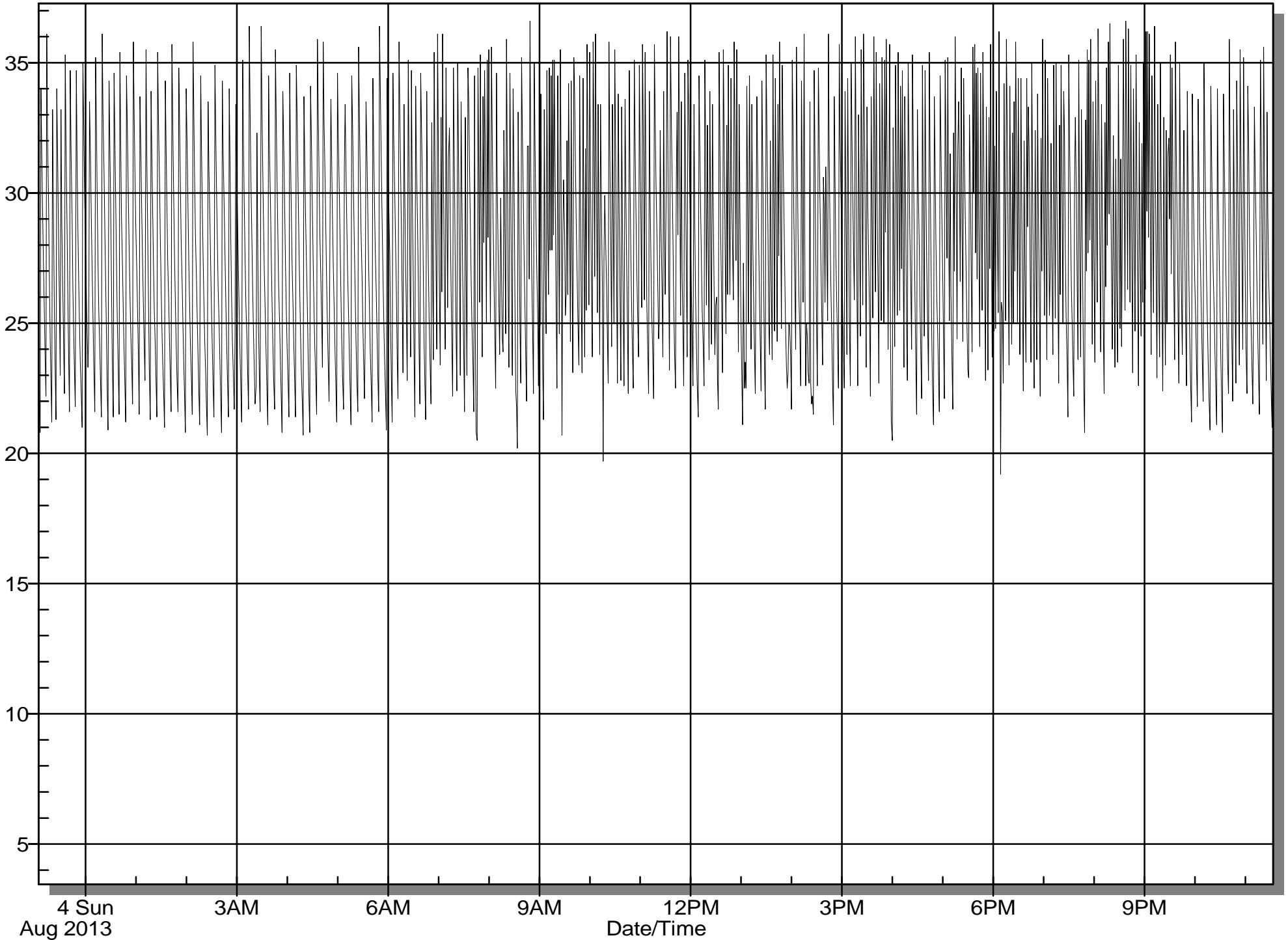
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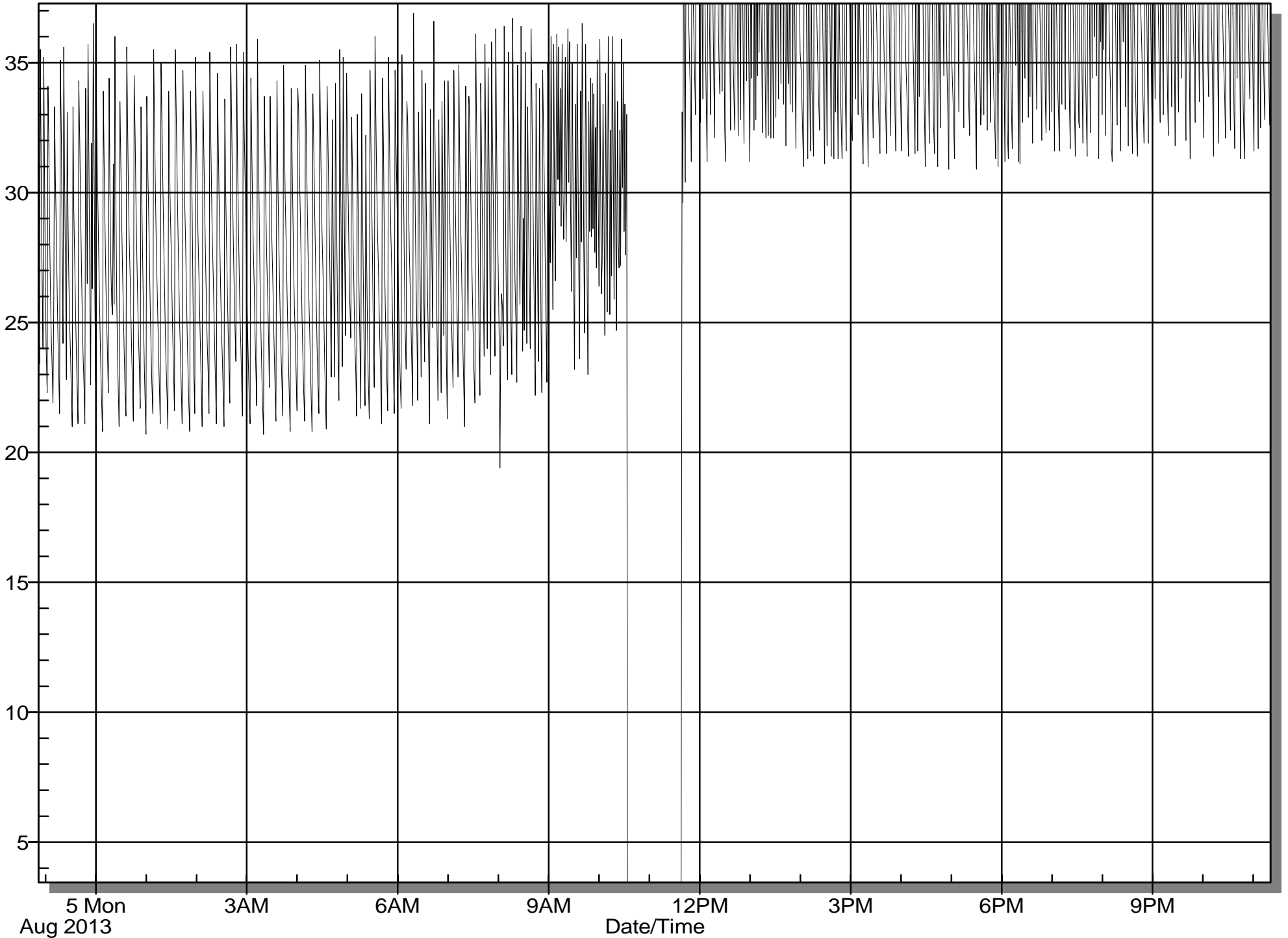
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(PR125 2)-Pressure/psig



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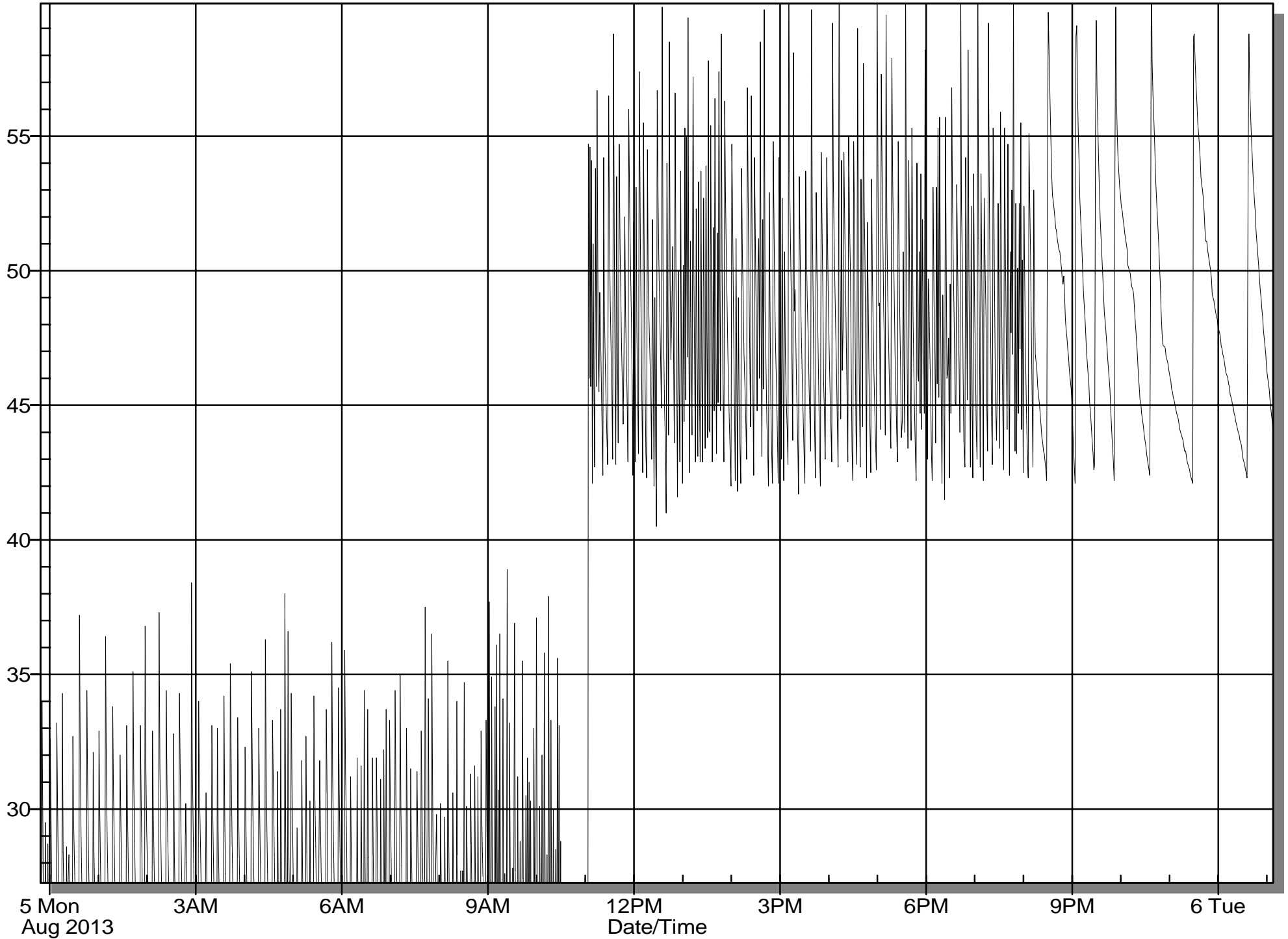
(PR125 2)-Pressure/psig



4419 State Highway 3

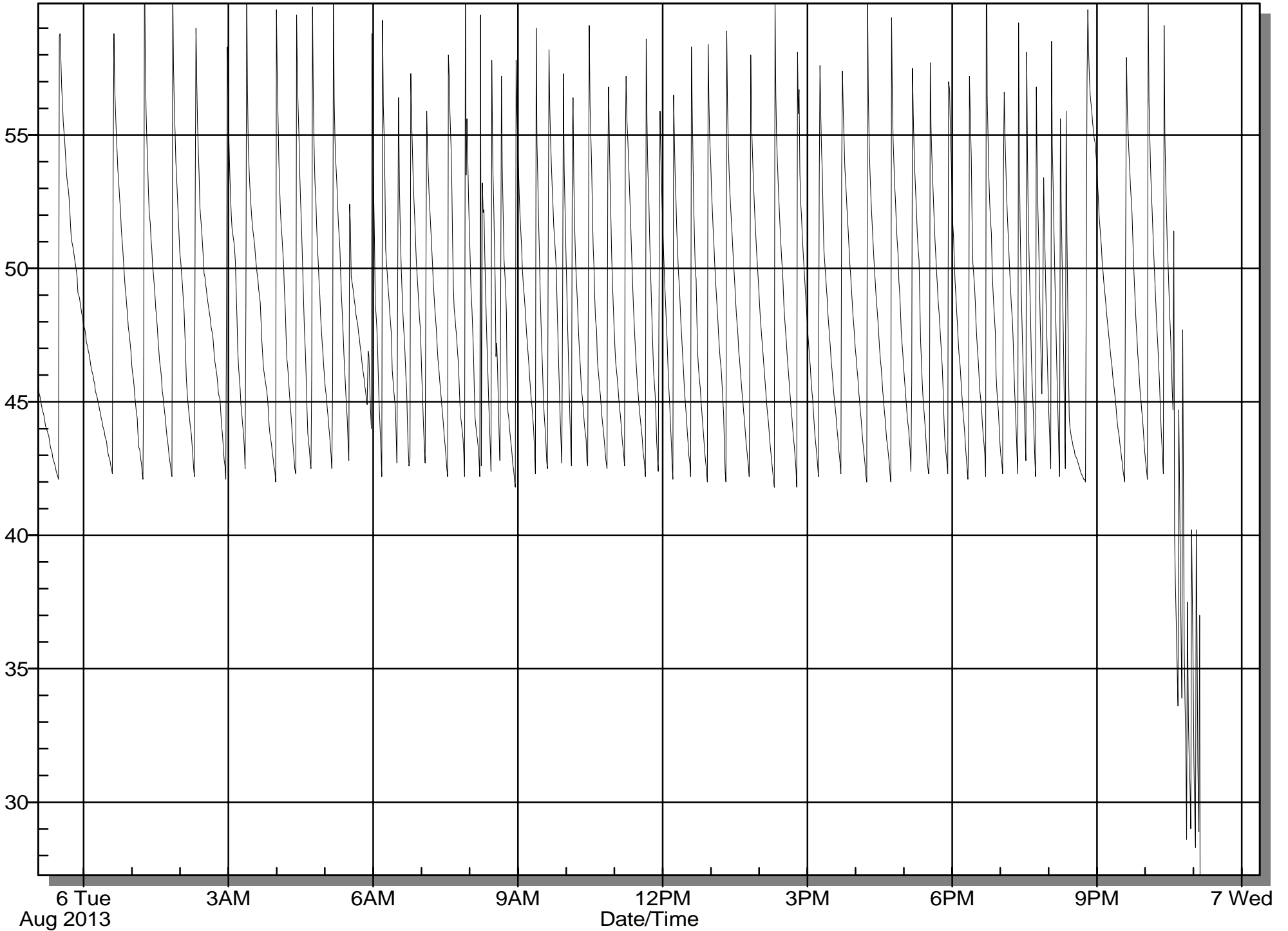
4419 State Hwy 3

(PR125 1)-Pressure/psig



4419 State Hwy 3

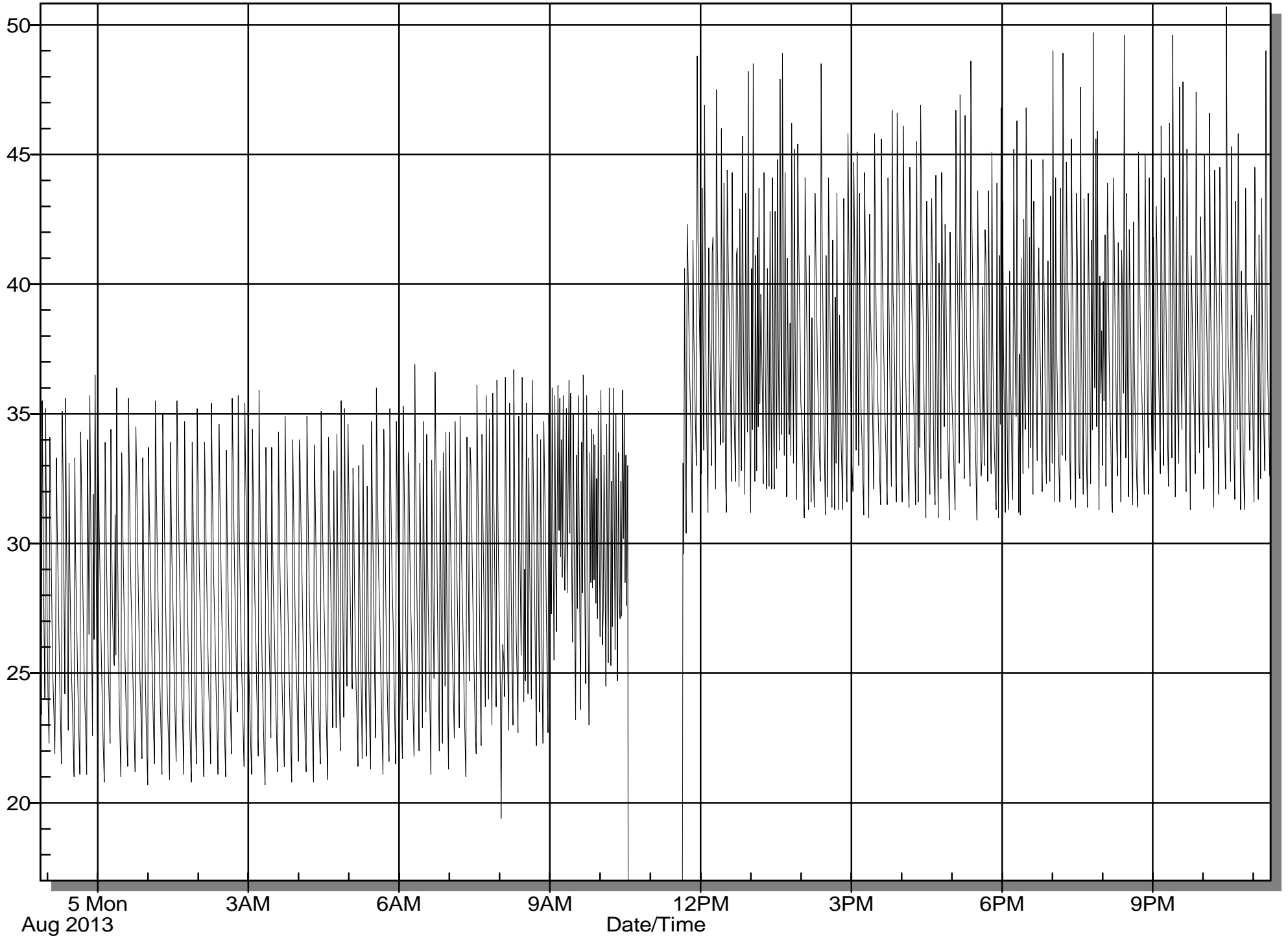
(PR125 1)-Pressure/psig



42 Woodhaven Drive

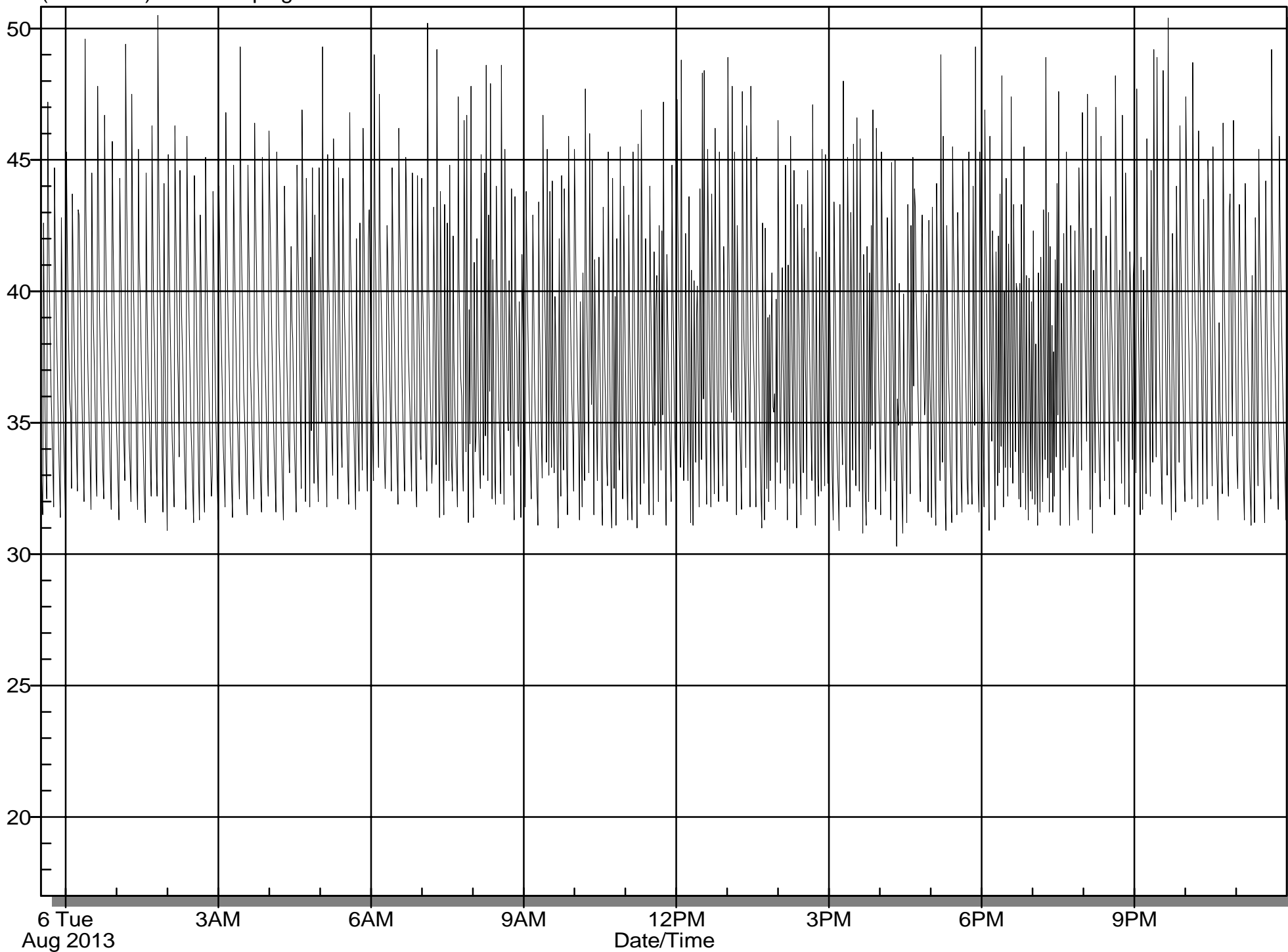
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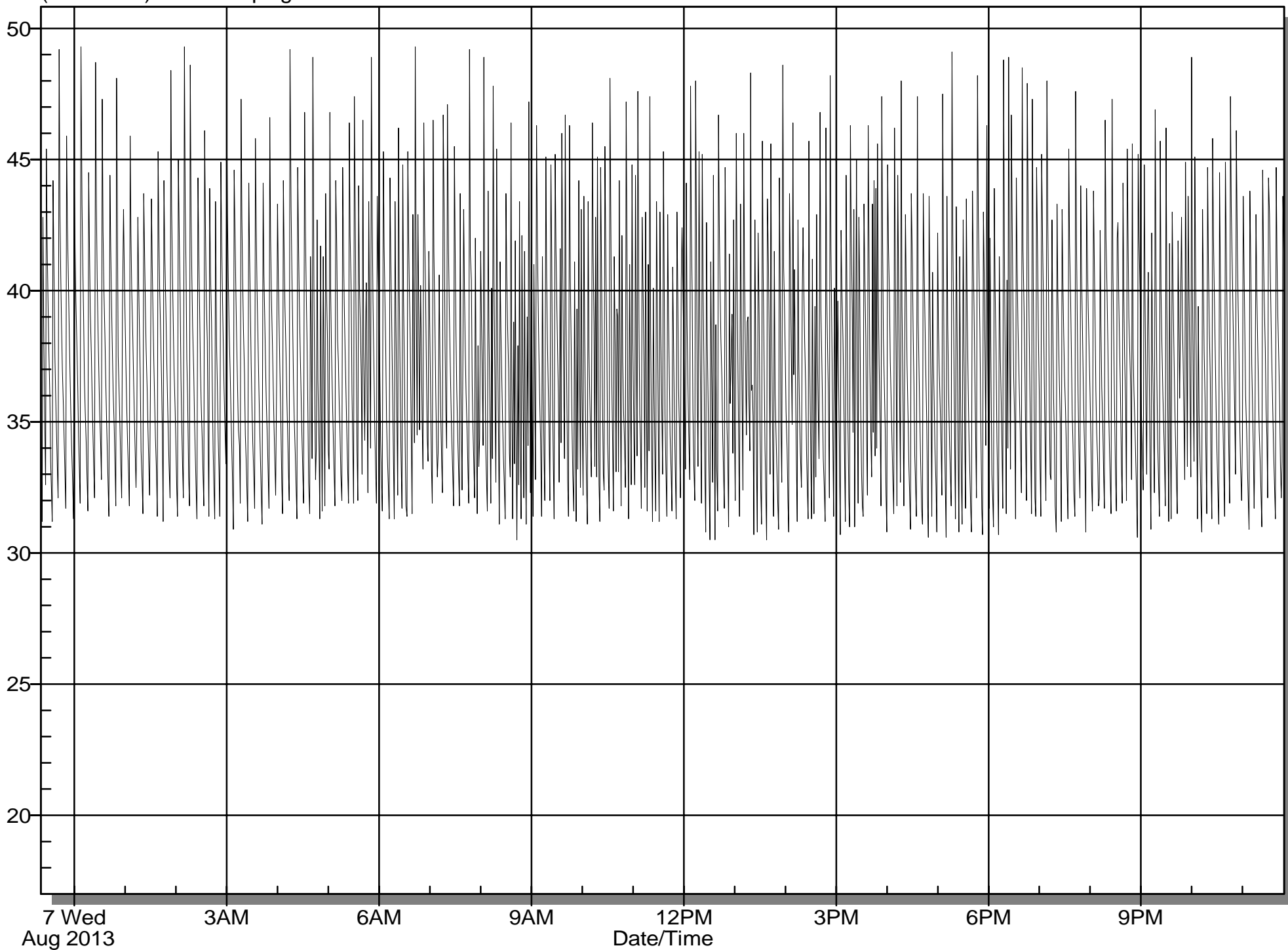
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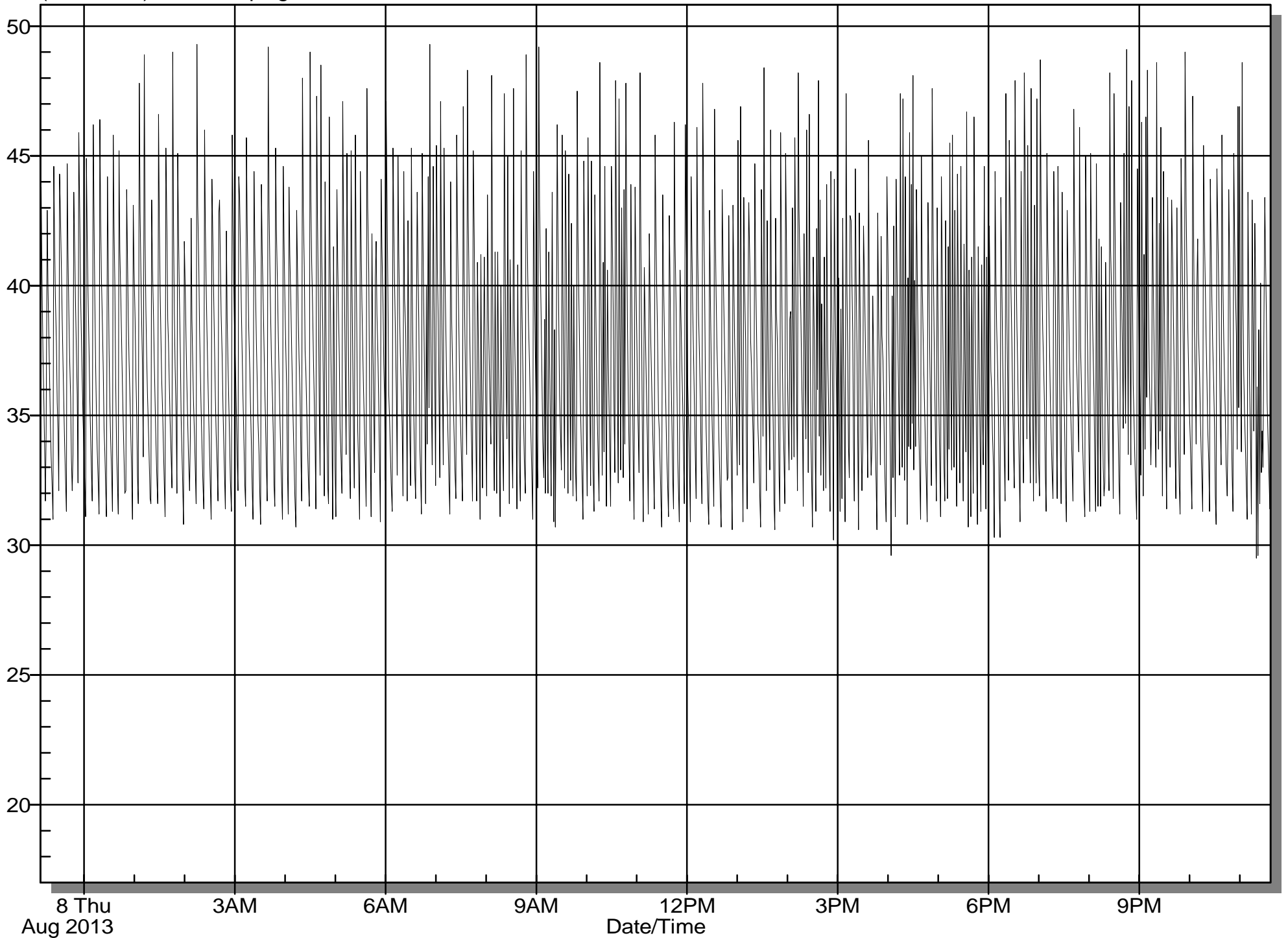
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(PR125 2)-Pressure/psig



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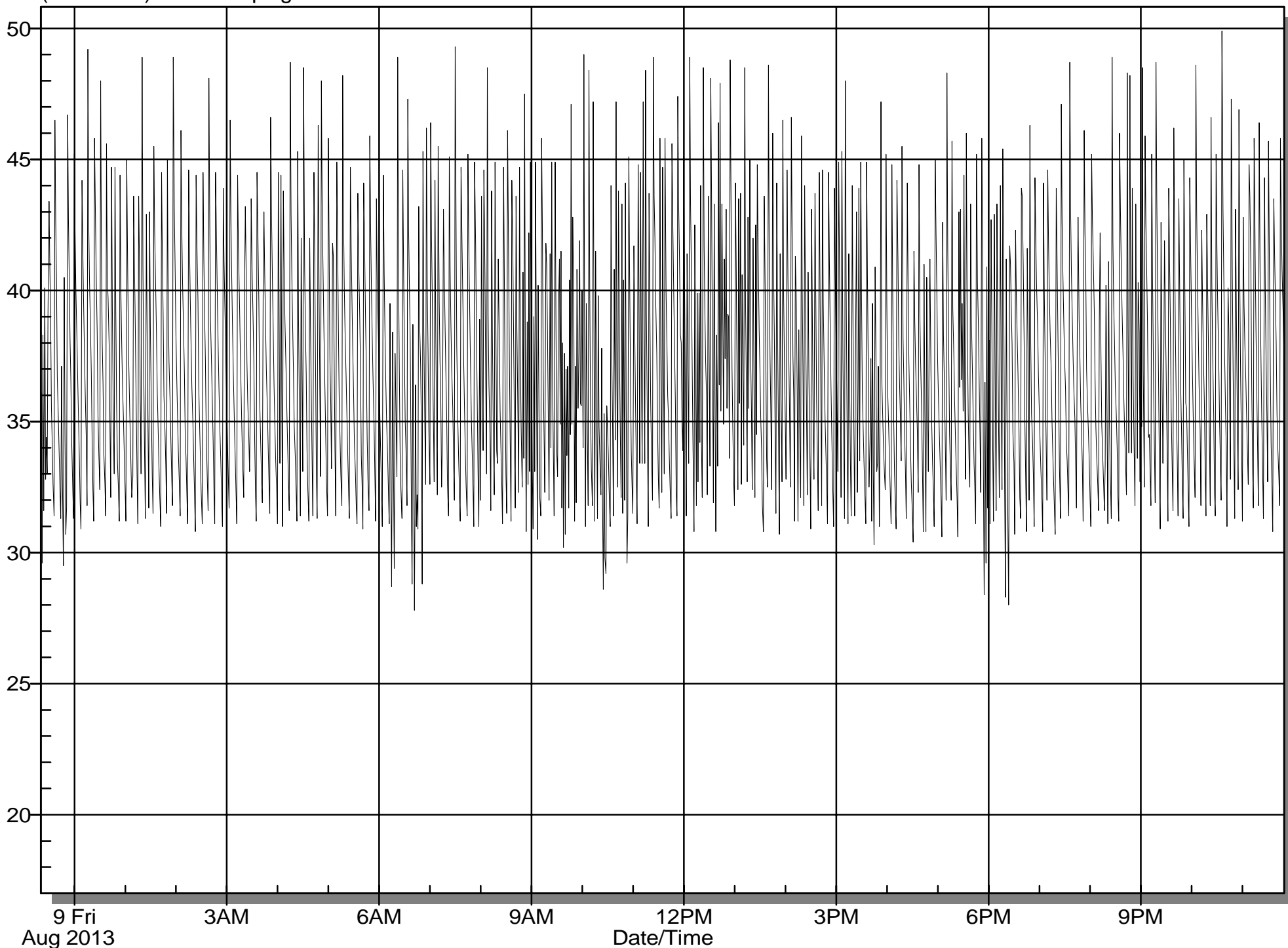
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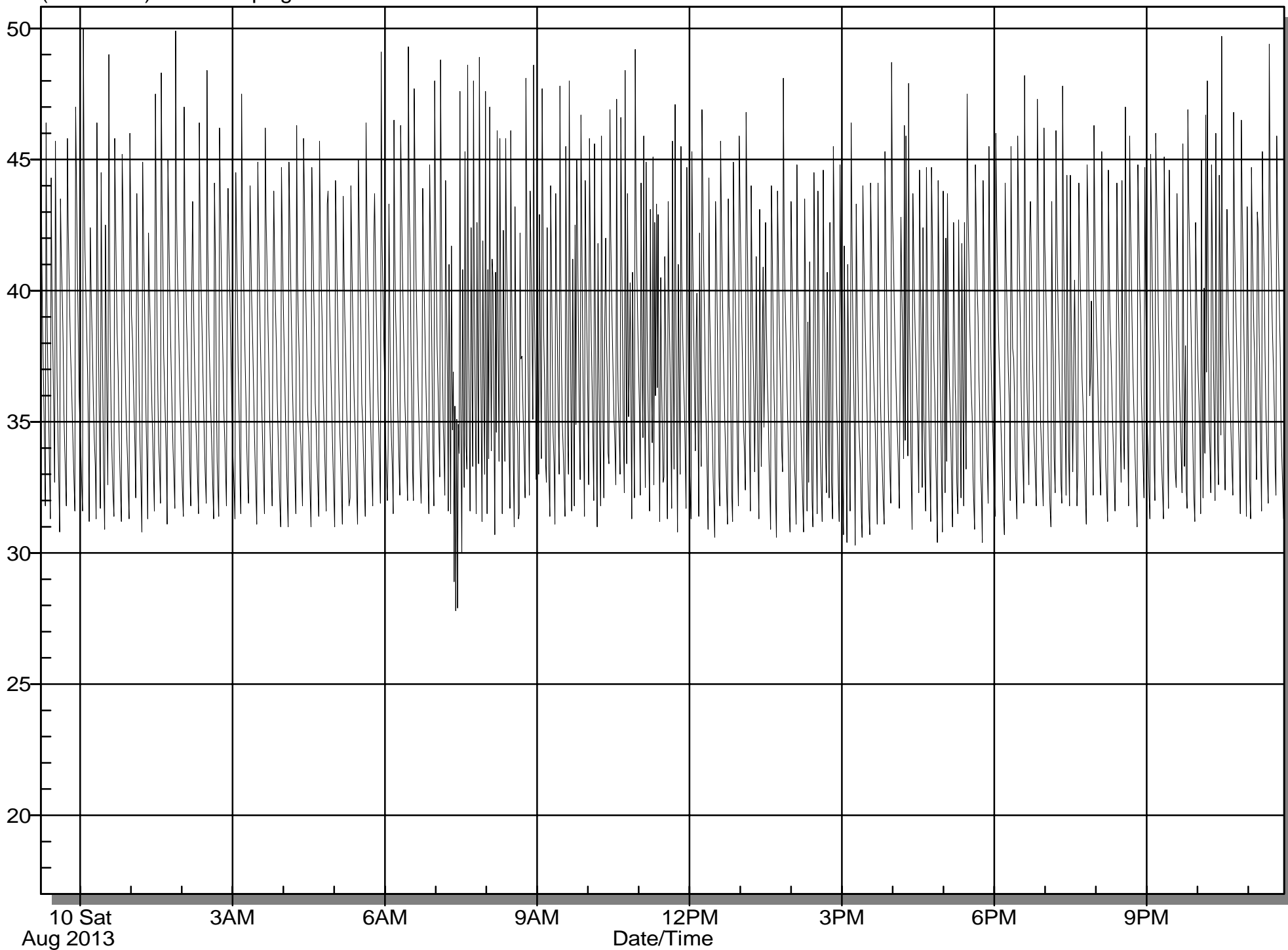
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(PR125 2)-Pressure/psig



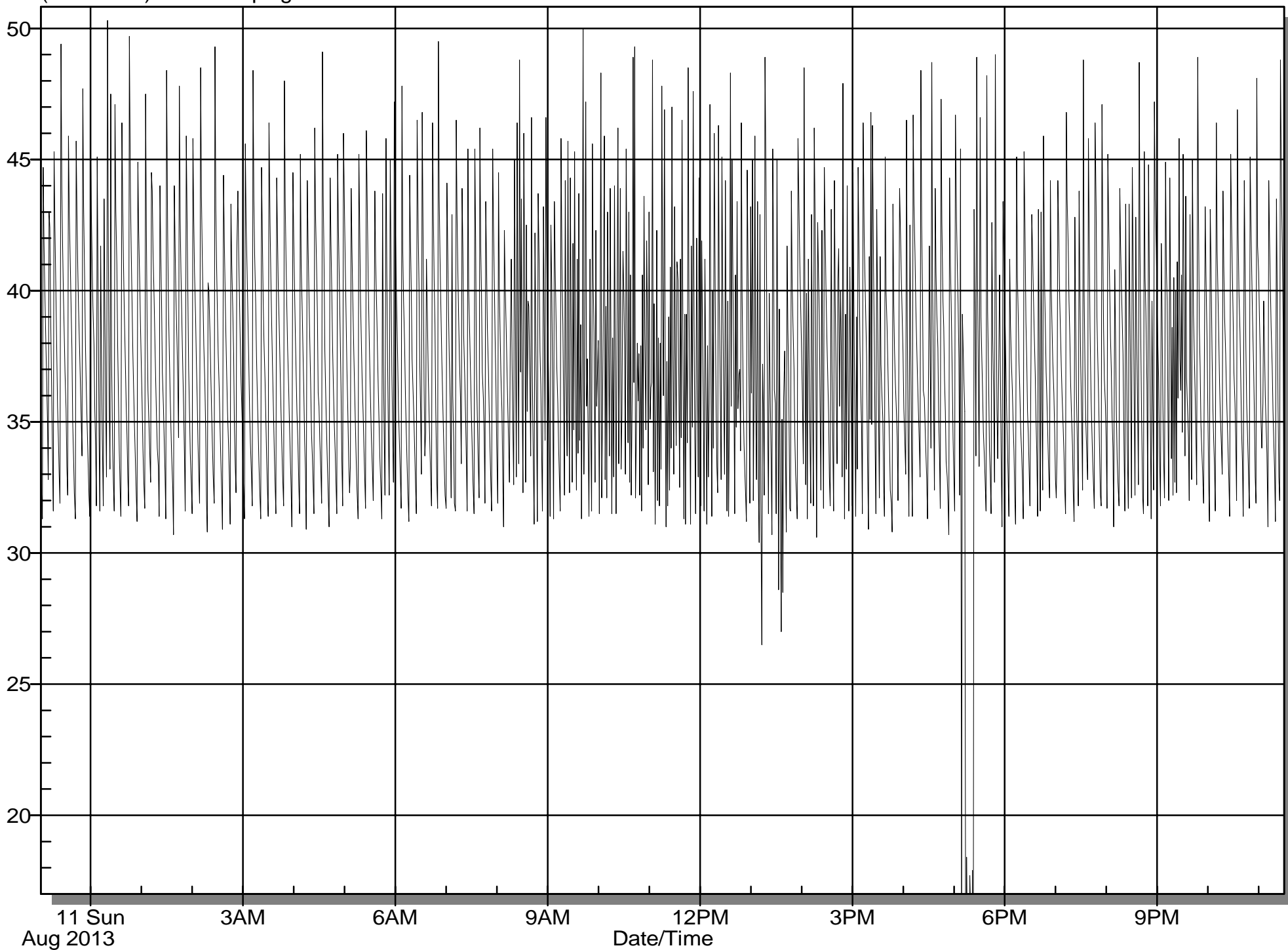
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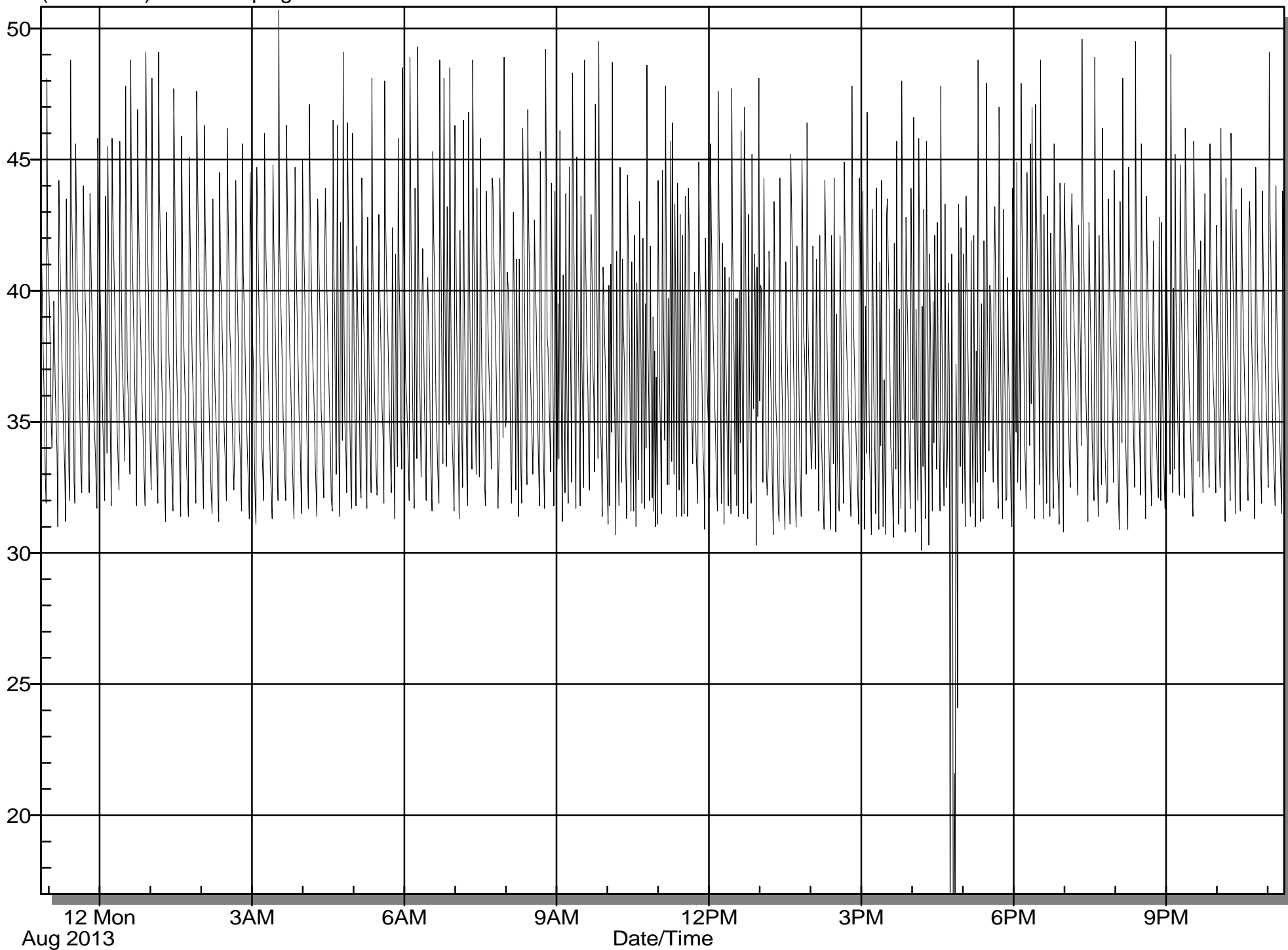
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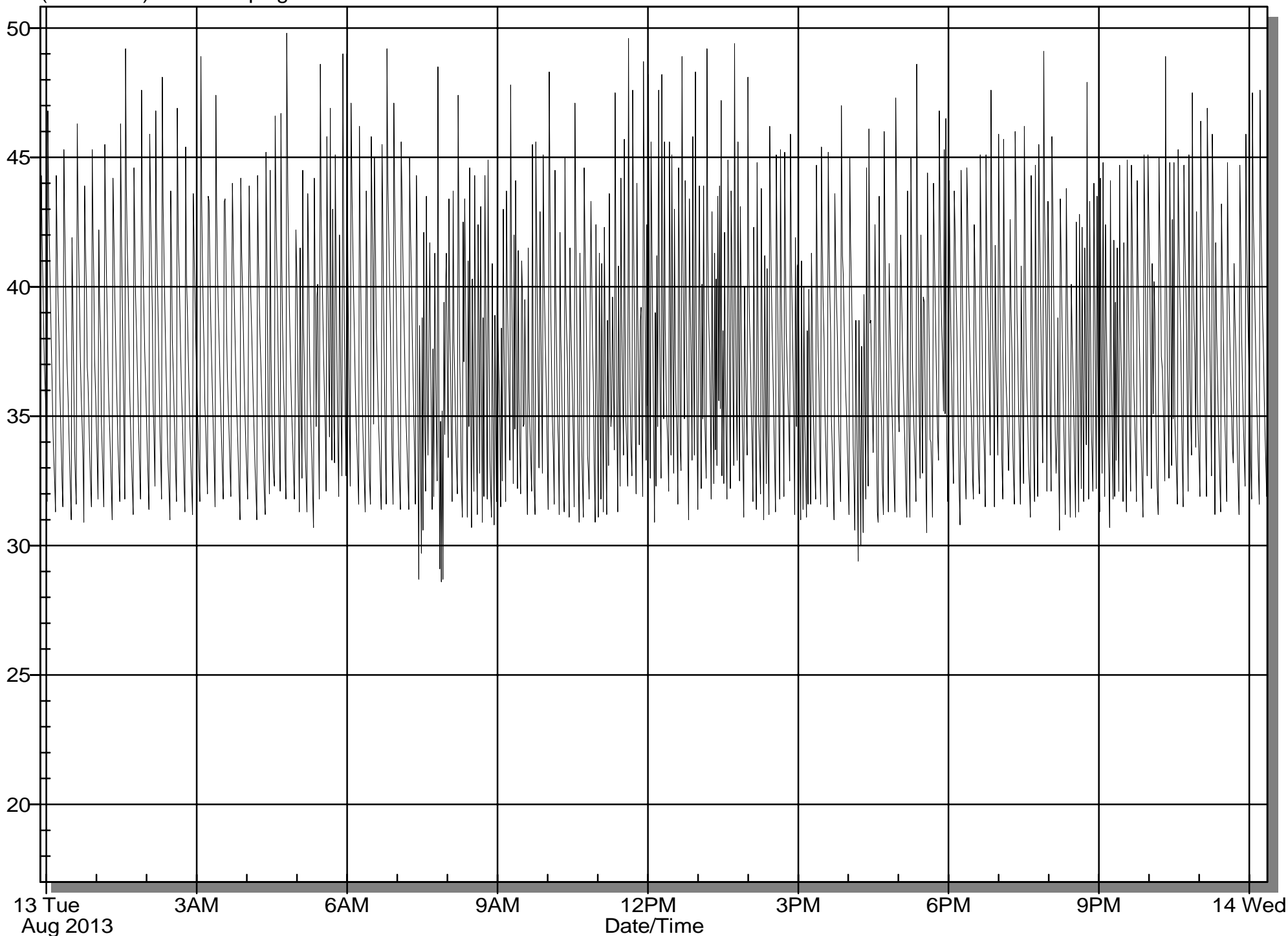
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(PR125 2)-Pressure/psig



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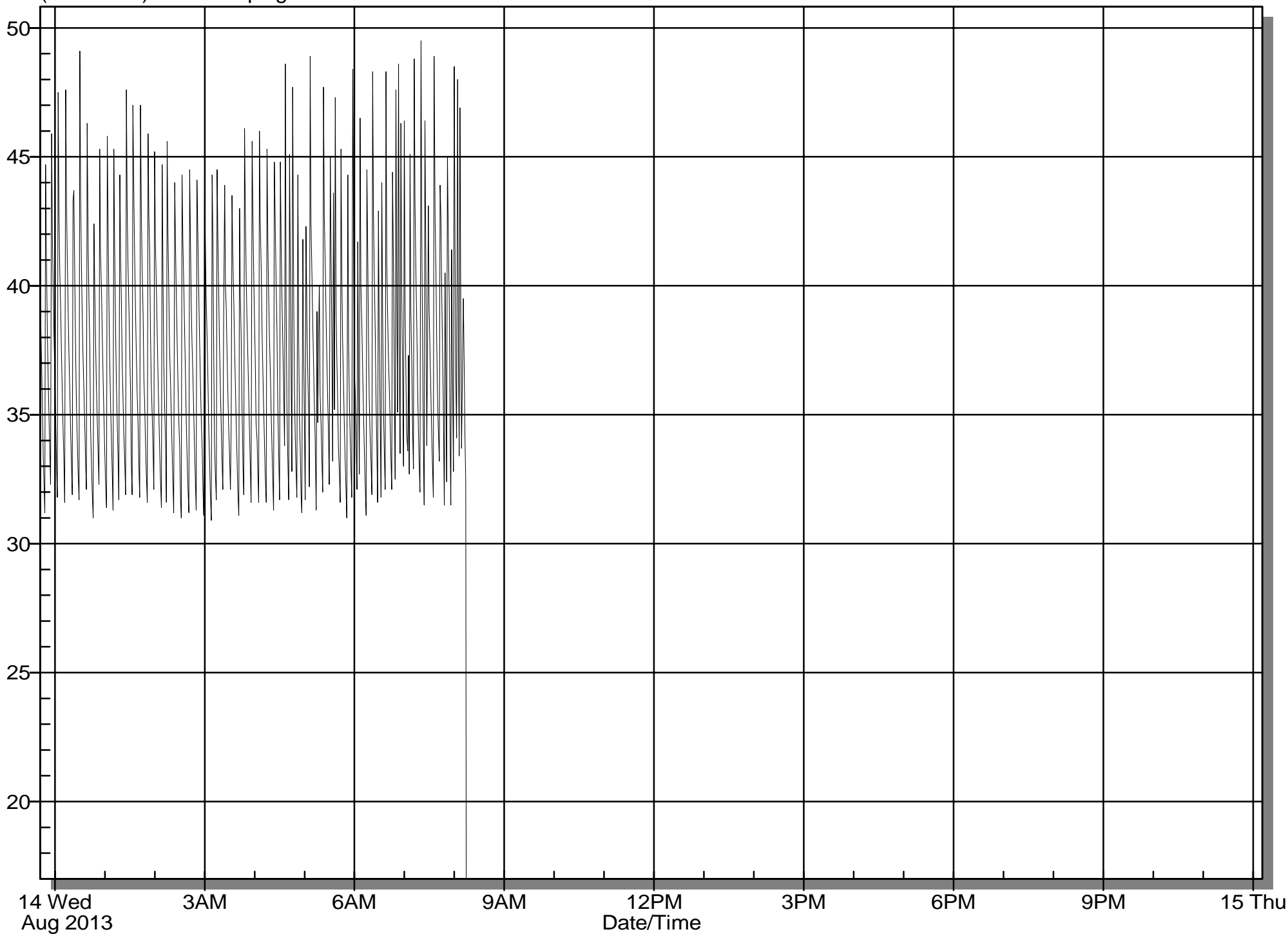


Exhibit 6

Star Lake Tank Inspection Report

Potable Water Reservoir Contamination, Health and Safety Report

Job No. 33017 Utility Star Lake Water Tank 200 kg 0/6
 Inspector Preston Welsh Team Leader Miles Loftis Date 9/30/09 Form 1

Complies With: AWWA • OSHA • ANSI • NIOSH • NAVFAC • NFPAC

Contamination & Health Checklist

Air Vents Type: Ball # 1 Screen Conditions: Good Fair Poor
 Hatches Type: Round # 1 Secured Properly: Yes No Properly Sealed: Yes No
 Exterior Overflow Flapper: Yes No Screen: Yes No Gasket: Yes No Condition: Good Fair Poor
 Cathodic Covers Covers in Place: Yes No Gaskets: Yes No Properly Sealed: Yes No # of Covers
 Roof to Wall Joint Welded: Yes No Properly Sealed: Yes No
 Roof Integrity Holes: Yes No Cracking: Yes No Standing Water: Yes No Other: N/A
 Wall Integrity Holes: Yes No Cracking: Yes No Other: N/A
 Manway Integrity Leaks: Yes No Condition: Good Fair Poor
 Water Clarity General Appearance: Clear Odor: None Other: N/A
 Floating Surface Debris Type: None Source: N/A
 Hypalon Floating Cover Condition: Good Fair Poor Holes: Yes No Tears: Yes No
 Telemetry Penetrations Properly Sealed: Yes No
 Other Discrepancies:

Facility Safety Compliance Checklist

Exterior Ladder

Overall Ladder Condition: Good Fair Poor Offset Landings Yes No # Height
 Ladder Vandal Guard Present: Yes No Vandal Guard Locked: Yes No
 Ladder Rails & Rungs Condition: Good Fair Poor Missing/Damaged Rungs: Yes No
 Rung Spacing & Depth Spacing: 12' in (max 12") Toe depth: 6" in (min 7")
 Rail Spacing & Size Width: 2" in (min 2") Thickness: 1/4" in (min 1/4") Rail to Rail: 15" in (max 16")
 Safety Climb System Type: Cage Notched Rail Cable Grab Other None Condition: Good Fair Poor
 Number & Locations Wall 1 Leg Roof Riser Pipe Other
 Ladder Attachments Welder Bolted Other

Manways

Type and Size Type: Round Oval Square Other Size 24" (24" - 18"X22" min) # 1
 Support Structure Dogged Davit Arm Bolted Other Condition: Good Fair Poor
 Number & Locations Wall 1 Roof Riser Pipe Other

Hatches

Hatch Type and Size Round Square Rectangle Other (24" - 24"X15" min) 24"
 Hatch & Lid Lip Height Hatch (4" min.) 5 1/2" Lid (2" min.) 2"

Balconies & Railing

Deck/Walkways Condition: Good Fair Poor Width:
 Hand Rails Condition: Good Fair Poor Height (42" min.) No. Rails (min. 2)
 Toe Rail Condition: Good Fair Poor Height (4" min.)
 Welds/Attachments Condition: Good Fair Poor

Roof

Safety Tie-Off Points Condition: Good Fair Poor # 10+
 Antennas Types: Transmitting Point to Point Omni Directional Receiving # 2

Other Discrepancies

Additional Information

DISCLAIMER

Unless otherwise noted, the findings contained in this report were neither prepared nor reviewed by a licensed Professional Engineer, but are based on the experience, training and visual examination of the inspecting Dive Maintenance Technician.

Steel Potable Water Reservoir Inspection Report

Job No. 33017Utility Star Lake WaterTank 200kg 0/G

AMERICAN WATER WORKS ASSOCIATION

ANSI/AWWA M42 / D101-53 (R86)

SSPC Legend

Society for Protective Coatings

RUST GRADE	DESCRIPTION
10	No rusting, or < 0.01% of surface is rusted
9	Minute rusting, < 0.03% of surface is rusted
8	Few isolated rust spots, < 0.1% of surface is rusted
7	Few isolated rust spots, < 0.3% of surface is rusted
6	Extensive rust spots, < 1% of surface is rusted
5	Rusting to the extent of 3% of surface area
4	Rusting to the extent of 10% of surface area
3	Approximately 1/6th of the surface (17%) is rusted
2	Approximately 1/3rd of the surface (33%) is rusted
1	Approximately 1/2 of the surface (50%) is rusted
0	Approximately 100% of the surface is rusted

NACE Legend

National Association of Corrosion Engineers

CORROSION GRADE	DESCRIPTION
A	None
B	Uniform Surface Corrosion
C	Pitting
D	Concentration Cell
E	Galvanic
F	Stress Corrosion Cracking
G	Erosion Corrosion
H	Intergranular
I	Dealloying

AWS Legend

American Welding Society

WELD GRADE	DESCRIPTION
L	Satisfactory
M	Spatter
N	Porosity
O	Convexity / Concavity
P	Cracks
Q	Inclusions
R	Incomplete Fusion
S	Incomplete Penetration
T	Undercut
U	Underfill
V	Overlap
W	Unable to Evaluate

INTERIOR RESERVOIR ROOF:

QUADRANT 1

SSPC NACE AWS

9 B L

QUADRANT 2

SSPC NACE AWS

3 B L

QUADRANT 3

SSPC NACE AWS

3 B L

QUADRANT 4

SSPC NACE AWS

3 B L

Vents

Roof Panels

Roof Support Structure

Roof Support Gussets

Painting Ring

Protective Coating

Good Fair Poor: ~~Blistering~~ Chalking - Checking - ~~Cracking~~ - ~~Delamination~~ - Growth - Pinholes - ~~Staining~~ Saggs/Runs
 Blisters / Avg. Size 1/16" Pitting / Avg. Size N/A

INTERIOR RESERVOIR WALLS:

QUADRANT 1

SSPC NACE AWS

3 B L

QUADRANT 2

SSPC NACE AWS

3 B L

QUADRANT 3

SSPC NACE AWS

3 B L

QUADRANT 4

SSPC NACE AWS

3 B L

Wall to Roof Weld

Lower Ring Panels

Middle Ring Panels

Upper Ring Panels

Interior Ladder

Protective Coating

~~Good~~ Fair Poor: ~~Blistering~~ Chalking - Checking - ~~Cracking~~ - ~~Delamination~~ - Growth - Pinholes - ~~Staining~~ Saggs/Runs
 Blisters / Avg. Size 1/16" Pitting / Avg. Size N/A

INTERIOR RESERVOIR FLOOR:

QUADRANT 1

SSPC NACE AWS

4 B L

QUADRANT 2

SSPC NACE AWS

4 B L

QUADRANT 3

SSPC NACE AWS

4 B L

QUADRANT 4

SSPC NACE AWS

4 B L

Perimeter Weld

Floor Sketches (Panels)

Protective Coating

~~Good~~ Fair Poor: ~~Blistering~~ Chalking - Checking - ~~Cracking~~ - ~~Delamination~~ - Growth - Pinholes - ~~Staining~~ Saggs/Runs
 Blisters / Avg. Size 1/16" Pitting / Avg. Size N/A

DISCLAIMER

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Steel Potable Water Reservoir Inspection Report

Job No. 33017Utility Star Lake WaterTank 200Kq 0/6INTERIOR RESERVOIR SUPPORT COLUMNS₁

	QUADRANT 1			QUADRANT 2			QUADRANT 3			QUADRANT 4		
	SSPC	NACE	AWS	SSPC	NACE	AWS	SSPC	NACE	AWS	SSPC	NACE	AWS
Column Structures	<u>2</u>	<u>B</u>	<u>L</u>	<u>2</u>	<u>B</u>	<u>L</u>	<u>2</u>	<u>B</u>	<u>L</u>	<u>2</u>	<u>B</u>	<u>L</u>
Column Base Structure	<u>2</u>	<u>B</u>	<u>L</u>	<u>2</u>	<u>B</u>	<u>L</u>	<u>2</u>	<u>B</u>	<u>L</u>	<u>2</u>	<u>B</u>	<u>L</u>
Column To Roof Structure	<u>2</u>	<u>B</u>	<u>L</u>	<u>2</u>	<u>B</u>	<u>L</u>	<u>2</u>	<u>B</u>	<u>L</u>	<u>2</u>	<u>B</u>	<u>L</u>
Protective Coating	Good Fair Poor: Blistering - Chalking - Checking - Cracking - Delamination - Growth - Pinholes - Staining - Saggs/Runs											
	Blisters / Avg. Size <u>1/16"</u>						Pitting / Avg. Size <u>N/A</u>					

INTERIOR RESERVOIR PLUMBING COMPONENTS

	QUADRANT 1			QUADRANT 2			QUADRANT 3			QUADRANT 4		
	SSPC	NACE	AWS	SSPC	NACE	AWS	SSPC	NACE	AWS	SSPC	NACE	AWS
Inlet Plumbing	<u>2</u>	<u>B</u>	<u>L</u>									
Outlet Plumbing	<u>2</u>	<u>B</u>	<u>L</u>									
Manways	<u>3</u>	<u>B</u>	<u>L</u>									
Floor Drains												
Interior Overflows				<u>4</u>	<u>B</u>	<u>L</u>						

EXTERIOR RESERVOIR ROOF₁

	QUADRANT 1			QUADRANT 2			QUADRANT 3			QUADRANT 4		
	SSPC	NACE	AWS	SSPC	NACE	AWS	SSPC	NACE	AWS	SSPC	NACE	AWS
Vents	<u>9</u>	<u>B</u>	<u>L</u>									
Roof Panels	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>
Access Hatches	<u>3</u>	<u>B</u>	<u>L</u>									
Protective Coating	Good Fair Poor: Blistering - Chalking - Checking - Cracking - Delamination - Growth - Pinholes - Staining - Saggs/Runs											
	Blisters / Avg. Size <u>N/A</u>						Pitting / Avg. Size <u>N/A</u>					

EXTERIOR RESERVOIR WALLS₁

	QUADRANT 1			QUADRANT 2			QUADRANT 3			QUADRANT 4		
	SSPC	NACE	AWS	SSPC	NACE	AWS	SSPC	NACE	AWS	SSPC	NACE	AWS
Wall to Roof Weld	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>
Lower Ring Panels	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>
Middle Ring Panels	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>
Upper Ring Panels	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>	<u>9</u>	<u>B</u>	<u>L</u>
Interior Overflows				<u>9</u>	<u>B</u>	<u>L</u>						
Protective Coating	Good Fair Poor: Blistering - Chalking - Checking - Cracking - Delamination - Growth - Pinholes - Staining - Saggs/Runs											
	Blisters / Avg. Size <u>N/A</u>						Pitting / Avg. Size <u>N/A</u>					

FOOTINGS / FOUNDATION₁

Footings / Foundations	Satisfactory <u>yes</u>	Cracking <u>Burred</u>	Spalling <u>Burred</u>	Erosion/Exposed Aggregate
Anchor Bolts	Satisfactory	Loose	Rusted / Corroded	(If Excessive) Diameter

TOWER SUPPORT STRUCTURES₁

Tower Legs / Columns	Satisfactory	Alignment	Settling	Rust / Corrosion
Riser Pipe	Satisfactory	Alignment / Settling	Frost Casing	Rusted / Corroded
Rods & Turnbuckles	Satisfactory	Turnbuckle Tension	Rod Tension	Cotter Pins/Rod Nuts
Leg shoes / Brackets	Satisfactory	Coating <u>A</u>	Rusted / Corroded	Pitting / Cracking
Other				

DISCLAIMER

Liquid Engineering Corporation does not provide consulting engineering services. Unless otherwise noted, the findings contained in this report were neither prepared nor reviewed by a licensed Professional Engineer, but are based on the experience, training and visual examination of the inspecting Dive Maintenance Technician.

Liquid Engineering Corporation
Circular Tank Diagram / Information Worksheet

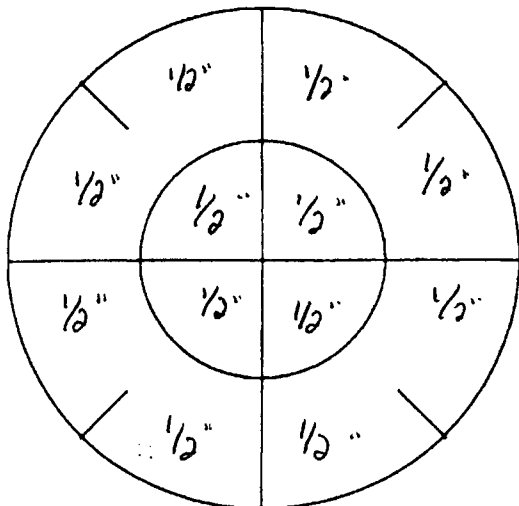
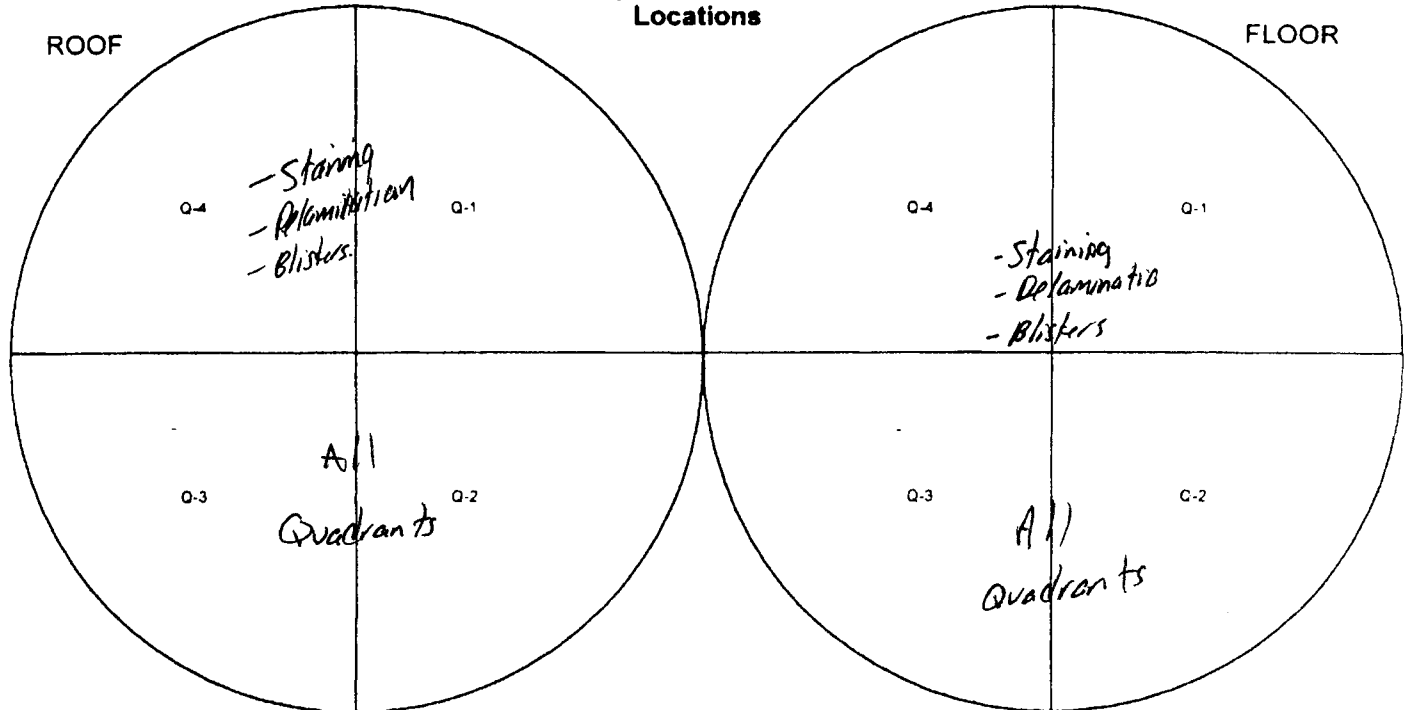
Job# 33017

Tank Name: 200kg O/G

Date: 9/30/08

	WALLS	Q-4	Q-1	Q-2	Q-3
Roof line	<p><i>All Quadrants</i></p> <ul style="list-style-type: none"> - Staining - Delamination - Blisters. 				
Floor line					

Testing and Discrepancy
Locations

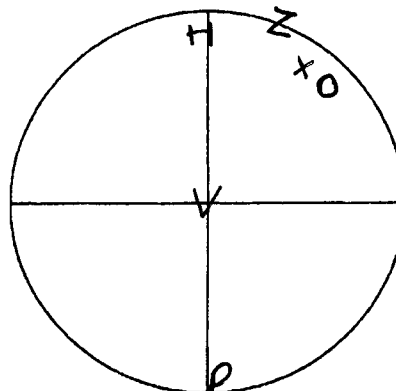


Sediment Depth Measurements

Average Sediment Depth= The sum of all measurements taken, divided by the number of measurements taken.

Average Sediment Depth: 1/2" Cubic Yardage: _____

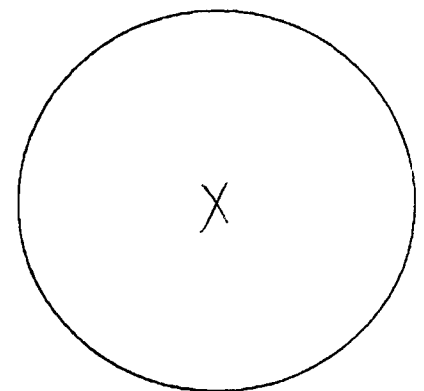
Type of Sediment: Iron, Mag, silt



Plumbing & Structure Location

Plumbing and Structure Codes

O=Outlet X=Inlet Z=Manway
V=Vent D=Drain S=Sump
L=Ladder H=Hatch P=Overflow
F=Float level Indicator
T=Telemetry

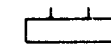


Column Placement =+

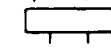
Type of Column



Base Structure



Top Structure



Steel Concrete Other: _____

Job No.: 33017

Tank Name: 200 Kg 0/6

Date 9/30/08

Section 9. General Tank Security

Is the tank surrounded by a security fence?	Yes <input checked="" type="radio"/> No
Are the access gates locked?	Yes No
Is the tank equipped with a vandal guard on the primary access ladder?	Yes <input checked="" type="radio"/> No
Is the vandal guard locked?	Yes No
Are all of the access hatches equipped with electronic monitoring devices?	Yes <input checked="" type="radio"/> No
Are all of the vents equipped with security vent shrouds?	<input checked="" type="radio"/> Yes No
Does the exterior of the tank show signs of trespass?	<input checked="" type="radio"/> Yes No
Does the surrounding geography of the tank obscure it from public view?	<input checked="" type="radio"/> Yes No
Are the external plumbing components housed in a secure vault or out building?	<input checked="" type="radio"/> Yes No
Is the area surrounding the tank well lit?	<input checked="" type="radio"/> Yes No
Are there any additional security features associated with this tank or surrounding area? If yes, describe in additional remarks section.	Yes <input checked="" type="radio"/> No

Additional Remarks and Measurements

[illegible]

Liquid Engineering Corporation
Section 17: Immediate Needs Assessment

Job No.: 33017 Tank Name: 200kg Date _____

I. Health & Safety Items

- ☒ Safety Climb System Installation: no safety climb system present
☐ Vent Screen Repairs: none recommended

II. Testing Items

- ☐ Dye Testing For Leak Evaluation: not done
☐ Presence of Lead Test (Interior+Exterior): negative

III. Destructive Testing Items

- ☐ % Of Lead Test (Interior / Exterior)(Coating samples are removed for laboratory analysis): Not done
☐ Coating Adhesion Testing (Interior / Exterior): Not done

Specific written authorization required to perform destructive testing. Destructive tests include touch-up of coating system.

IV. Repair Items

- ☐ Epoxy Coating Repairs: none recommended
☐ Temporary Leak Repairs: none recommended
☐ Float Operated Level Indicator Repairs / Maintenance: N/A
☐ Hypalon Repairs: N/A

V. Security Related Items (Critical security upgrade information is immediately available.)

- ☒ Tank Vents Are Not Equipped With A Security Vent Shroud. _____
☒ Tank Hatches Are Not Equipped With A Security Hatch Locking Device. _____
☒ Tank Perimeter Not Adequately Secured: _____
☐ EPA - Mandated Vulnerability Assessment Not Completed: _____

Additional Description of Recommended Work

* Security Items marked above

* Clean + Inspect every 3 years.

* Recommend Interior Blast + Recoat

The above noted additional work is considered immediately necessary and recommended to be completed. Some items may be completed in conjunction with work currently being performed while the field crew is on site.

Authorized Utility Signature: _____

Signing above acknowledges that recommendations have been made for additional work that may be necessary and can be completed while the LEC crew is on site. Signing above does not authorize additional work. An additional work authorization will be prepared to authorize any additional work desired.

Exhibit 7

Water System Violations, Conservation and Boil Water Notices

NEW YORK
state department of
HEALTH

Nirav R. Shah, M.D., M.P.H.
Commissioner

Sue Kelly
Executive Deputy Commissioner

April 9, 2012

Mr. Mark Hall, Supervisor
And Fine Town Board
P.O. Box 238
Star Lake, NY 13695

Re: Public Water Supply
Star Lake Water District

Dear Supervisor Hall and Town Board Members:

An inspection of the Star Lake Water District was conducted on April 4, 2012, to determine compliance with Subpart 5-1 of the State Sanitary Code. I was accompanied by Town Supervisor and Water Superintendent Mark Hall. His assistance during the inspection was appreciated. Following is a description of the existing water system and a summary of our discussions and recommendations.

System Description

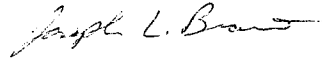
Water for the system is drawn from Star Lake, through an intake located in the eastern-most bay of the lake. Water flows by gravity through the intake to a sump where two 100-gallon per minute (gpm) submersible pumps pump water to the diatomaceous earth (DE) filter units. Vacuum pumps pull water through the DE filters and pump it to the 3,000-gallon clearwell. Prior to the water entering the clearwell, sodium hypochlorite is added for disinfection. Two high-lift pumps, each rated for 200 gpm, draw water from the clearwell and pump it into the distribution system. A 250,000-gallon steel tank provides system storage. The system serves approximately 927 people through 355 service connections.

Discussions and Recommendations

1. The issue with summer time water production seems to be exacerbated by much shorter filter runs, thus increasing the personnel time spent at the plant. One idea to possibly extend filter run times in the summer is to install bag filters ahead of the DE filters. This has been very successful in the Louisville water plant. Any modifications or alterations to the existing plant do need approval from this office.
2. The 250,000-gallon storage tank will eventually need to be re-painted or replaced. Any work on the existing tank or replacing a storage tank will require considerable capital, not to mention a lot of logistical planning. The Town should start the planning for this sooner, rather than later.
3. We have previously recommended that a Grade D certified distribution system operator be provided for the system. It is my understanding that Mr. Hall is in the process of obtaining Grade D certification.
4. We continue to recommend that the filter plant be equipped with a generator to power the plant during power outages.
5. The 2011 Annual Water Quality Report must be delivered to customers, with a copy sent to this office, on or before May 31, 2012.

Overall operation and maintenance of the system under Mr. Hall's supervision remains stupendous. Enclosed is a copy of the field compliance report form for your records. If you have any questions, please feel free to contact this office by writing NYS DOH Canton District Office, 58 Gouverneur Street, Canton, NY, 13617, or by phone at (315) 386-1040.

Sincerely,

A handwritten signature in cursive script, appearing to read "Joseph L. Brant".

Joseph L. Brant
Public Health Engineer I

Enclosure

cc: Ronald Sheppard, Canton DO
File

Nirav R. Shah, M.D., M.P.H.
Commissioner

NEW YORK
state department of
HEALTH

Sue Kelly
Executive Deputy Commissioner

April 9, 2012

Mr. Robert Snider, Supervisor
And Clifton Town Board
P.O. Box 684
Cranberry Lake, NY 12927

Re: Public Water Supply
Woodhaven Water District

Dear Supervisor Snider and Town Board Members:

An inspection of the Woodhaven Water District was conducted on April 4, 2012, to determine compliance with Subpart 5-1 of the State Sanitary Code. John Russell, Certified Operator, provided assistance and comic relief. His assistance and humor during the inspection was appreciated. Following is a description of the existing system and a summary of our discussions and recommendations.

System Description

The lone water source for the District is a drilled well, located inside the water treatment plant, off Woodhaven Drive. The well reportedly has a yield of approximately 40 gallons per minute. Water from the well is treated with chlorine for disinfection and a polyphosphate for corrosion control. A 3,000-gallon pressure tank maintains system pressure. The system serves approximately 55 people through 29 service connections.

Discussions and Recommendations

1. The existing water system configuration is extremely vulnerable to prolonged water outages, like the one that occurred in October of 2011 when the drop pipe in the well was replaced. Current design standards require adequate redundant components to ensure continued reliable water service. This is accomplished in one of two ways:
 - a. For systems with no treated water storage facilities: providing two separate sources of water, each capable of supplying the maximum daily demand, and a backup generator to allow water service during power outages,
OR
 - b. For systems with only one source: providing a treated water storage facility with a capacity equal to the maximum daily demand, and/or providing a backup generator.

The Woodhaven system does not meet either of the above scenarios. The Town must begin planning to address the lack of adequate redundant components. The Town could also look into a permanent connection to the Star Lake Water District. This connection could be used only in an emergency and with the agreement between both Towns.

2. The piping in the treatment building is leaking constantly. According to Mr. Russell, all piping in the treatment building is going to be replaced soon. The replacement will stop the leak and also include the installation of a master meter. The Town should make sure this work is done in a timely manner.

Public Water Supply Name: Star Lake Water DistrictFederal PWS ID: NY4404398 Program Code: 100Notification Date: August 17, 2012 County Code: 44Violation ID: 2012 14815 Violation Type: 44

TO: Fine Supervisor & Town Board
Town of Fine
4078 State Highway 3
Star Lake, NY 13690

This treatment technique violation is a result of more than 5% of the composite filtered effluent measurements exceeding the turbidity standard of 0.3 Nephelometric Turbidity Unit (NTU) for July 2012.

Notification of your failure to meet the monitoring and analytical requirement through posting of a written notice is required. The mandatory health language that must accompany the notice are enclosed. Public Notification must be made within **30 days** from the date of this Notice.

This office must receive written notification that the required public notification has been made; included in that correspondence must be the method of public notification used and the date that notification was made.

If you have any questions regarding this violation, contact this office by phone (315) 386-1040, fax (315) 386-1043 or mail at 58 Gouverneur Street, Canton NY 13617.

Sincerely,



Joanna Clifford-Allard
Senior Sanitarian

cc: Chief Operator
File



www.aFineAdirondackTown.org

(315) 848-3121

4078 State Hwy 3
Star Lake, NY 13690

Fax: (315) 848-3152

STATE OF EMERGENCY

Declaration

WHEREAS, it is apparent that within the Town of Fine there exists imminent threat to life and property because the Star Lake Water System is experiencing low water pressure; and

WHEREAS, current available water supply is not enough to meet maximum system demand, and water use restrictions are required to protect the integrity of the Star Lake Water System;

NOW, THEREFORE, pursuant to the provisions of section 24 of Article 2B of the New York State Executive Law, be it hereby

ORDERED that a **STATE OF EMERGENCY** now exists within the Star Lake Water District, due to low water pressure and lack of water supply in the Star Lake Water District, and, to preserve the public safety and render all required and available assistance vital to the security, well-being, and health of the citizens of the affected jurisdiction, all persons within Star Lake Water District are hereby:

PROHIBITED from using water from the Star Lake Water District for nonessential uses, which include the following:

- The use of hoses, sprinklers or other means for watering
- The use of water for washing automobiles, trucks, trailers or other equipment
- The washing of streets, driveways, homes, or other outdoor surfaces
- The use of water to fill swimming pools, or wading pools
- The use of water from fire hydrants
- Bathing should be kept to a minimum

ORDERED, that anyone violating this Order is guilty of a Class B misdemeanor, and subject to a fine to be fixed by the Court not to exceed \$250.00 for the first offense and \$500.00 for any subsequent offenses; and it is further

ORDERED, that anyone violating this Order may have his or her water service turned off until the state of emergency is rescinded; and it is further

ORDERED, that this order shall be effective at 1:00 pm on July 16, 2012, continuing until rescinded.

Mark Hall
Town Supervisor

July 2013



NOTICE

WATER USE RESTRICTIONS

The Star Lake Water System is experiencing high water demand and production capability limitations. Nonessential water use is prohibited.

Nonessential uses include the following:

- The use of hoses, sprinklers or other means for watering
- The use of water for washing automobiles, trucks, trailers or other equipment
- The washing of streets, driveways, homes, or other outdoor surfaces
- The use of water to fill swimming pools, or wading pools
- The use of water from fire hydrants
- Bathing should be kept to a minimum

Anyone violating these water use restrictions may have his or her water service turned off and is subject to a fine of to be fixed by the Court not to exceed \$250.00 for the first offense and \$500.00 for any subsequent offenses.

Everyone's cooperation is appreciated!

BOIL WATER UNTIL FURTHER NOTICE

Check the Town of Fine Webpage for updates
afineadironacktown.org

Mark Hall
Town Supervisor



Exhibit 8

Photos

Woodhaven Water Treatment Building



Star Lake Water Storage Tank



Star Lake Water Treatment Facility



Pumps



DE Backwash Holding Tank



Exhibit 9

Endorsement/Support Documentation



ST. LAWRENCE COUNTY INDUSTRIAL DEVELOPMENT AGENCY

Ernest J. LaBaff Industrial Building ~ 19 Commerce Lane, Suite 1 ~ Canton, New York 13617
Phone: (315) 379-9806 / TDD: 711 ~ Fax: (315) 386-2573 ~ www.SLCIDA.com

MEMBERSHIP

CHAIRMAN

Brian W. Staples
Brian Staples, CPA

*

VICE CHAIRMAN

Ernest LaBaff
President Emeritus,
Aluminum Brick & Glass
Workers International Union

*

SECRETARY

Lynn Blevins
Blevins Brothers, Inc.

*

Mark C. Hall

Town of Fine, New York

*

Andrew McMahon
Massena Electric Department

*

Donald Peck

St. Lawrence County
Board of Legislators

*

R. Joseph Weekes, Jr.
Weekes Agency

*

CHIEF EXECUTIVE OFFICER

Patrick J. Kelly
St. Lawrence County
Industrial Development Agency

*

CHIEF FINANCIAL OFFICER

Thomas A. Plastino
St. Lawrence County
Industrial Development Agency

August 21, 2013

Mr. Matthew J. Driscoll
President and CEO
New York State Environmental Facilities Corporation
625 Broadway
Albany, NY 12207-2997

Re: Fine and Clifton Water Improvement Project

Dear Mr. Driscoll:

Please accept this letter, written in support of a water infrastructure improvement project within the Towns of Fine and Clifton. This project is proactive in exploring the initiative of district consolidation for the purposes of combining resources and reducing expenses to all.

The Towns of Fine and Clifton are located wholly within the Adirondack Park in the St. Lawrence County. This once-flourishing community has experienced devastating economic decline over the last 30 years. Over 2,000 jobs have been lost, beginning in the late 1970s with the closure of the Jones & Laughlin Steel Mill and compounded by the most recent permanent closure of the Newton Falls Paper Mill. In addition to the economic decline of the region, the Towns have struggled with water shortages and infrastructure issues that threaten public health. The water infrastructure serves the Clifton-Fine Hospital, Clifton-Fine Central School, Clifton-Fine Municipal Golf Course and multiple food service and other small businesses along with the residences of Star Lake.

As a result of the introduction of unfiltered water into the drinking system to meet user demands, the Town of Fine declared water emergencies in each of the two (2) previous summers. Additionally, within the neighboring Town of Clifton, the Woodhaven water system is aged and in need of replacement. The Woodhaven water system consists of one (1) well and severely restricted water piping. The lack of redundancy, condition of the infrastructure and restricted water piping have led to often extended periods of time when the area has had no water service.

A future phase of this project is addressing issues of Significant Non-Compliance for Disinfection Byproducts in the hamlet of Newton Falls, located just 3 miles from the Woodhaven district in the Town of Clifton. With the Newton Falls Mill closure the small water system is losing 50 EDUs of demand and is significant oversized to meet the small residential needs.

We reiterate our support for this much-needed community infrastructure project. Grant funding and no-interest loans from the Drinking Water State Revolving Loan Fund are the only hope these Towns have to finance the improvements and avoid future public health emergencies.

Sincerely,

Patrick J. Kelly
Chief Executive Officer



THE SENATE
STATE OF NEW YORK

ALBANY OFFICE:
ROOM 612
LEGISLATIVE OFFICE BUILDING
ALBANY, NEW YORK 12247
(518) 455-3334
FAX: (518) 426-6921

UTICA OFFICE:
207 GENESEE STREET
UTICA, NEW YORK 13501
(315) 793-9072
FAX: (315) 793-0298

EMAIL ADDRESS:
griffo@nysenate.gov

August 21, 2013

Mr. Matthew J. Driscoll, President and CEO
New York State Environmental Facilities Corporation
625 Broadway
Albany, NY 12207-2997

Dear Mr. Driscoll:

I am writing to express my support for the Town of Fine and the Town of Clifton water infrastructure improvement project. This project is proactive in exploring the initiative of district consolidation for the purposes of combining resources and reducing expenses to all.

The Towns of Fine and Clifton, located wholly within the Adirondack Park in the St. Lawrence County, have experienced devastating economic decline over the last 30 years with the loss of over 2000 jobs resulting from the closure of the Jones & Laughlin Steel Mill in the late 1970s and the most recent permanent closure of the Newton Falls Paper Mill. In addition to the economic decline of the region, the Towns have struggled with water shortages and infrastructure issues that threaten public health. The water infrastructure serves the Clifton-Fine Hospital, Clifton-Fine Central School, Clifton-Fine Municipal Golf Course and multiple food service and other small businesses along with the residences of Star Lake.

The Town of Fine has declared water emergencies in each of the two (2) summers, which resulted in unfiltered water being introduced into the drinking water system to meet user demands. Additionally, in the neighboring Town of Clifton, the Woodhaven water system is aged and in need of replacement. The Woodhaven water system consists of one well, and severely restricted water piping. The lack of redundancy, condition of the infrastructure and restricted water piping have led to often extended periods of time with no water service to the area.

A future phase of this project is addressing issues of Significant Non-Compliance for Disinfection Byproducts in the hamlet of Newton Falls, located just 3 miles from the Woodhaven district in the Town of Clifton. With the Newton Falls Mill closure the small water system is losing 50 EDUs of demand and is significant oversized to meet the small residential needs.

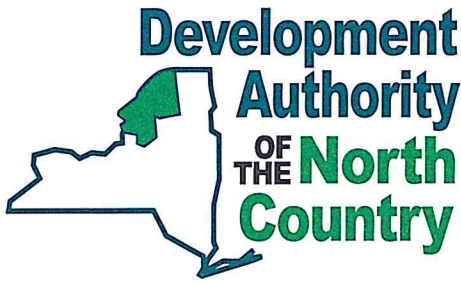
This letter is to provide support for this much needed community infrastructure project. Without grant funds and no interest loan from the Drinking Water State Revolving Fund, residents of the Towns will not be able to finance the improvements. Delaying this project will lead to further economic decline in the region and a potential public health emergency. Please support this water infrastructure project.

Sincerely,

A handwritten signature in black ink that reads "Joseph A. Griffo".

Joseph A. Griffo
Senator





WWW.DANC.ORG

Dulles State Office Building • 317 Washington Street, Suite 414 • Watertown, New York 13601 • Telephone (315) 661-3200 • Telefax (315) 661-3201 • TDD (800) 662-1220

Water Quality Facilities
Warneck Pump Station
23557 NYS Route 37
Watertown, New York 13601

Telephone (315) 661-3210
Telefax (315) 661-3211
Emergency Telephone (315) 786-4000

Open Access Telecom Network
Dulles State Office Building
317 Washington Street, Suite 406
Watertown, New York 13601

Telephone (315) 661-3200
Telefax (315) 661-3201
Emergency Telephone (866) 669-3262

Solid Waste Management Facility
23400 NYS Route 177
Rodman, New York 13682

Telephone (315) 661-3230
Telefax (315) 661-3231

August 21, 2013

Mr. Matthew J. Driscoll
President and CEO
New York State Environmental Facilities Corporation
625 Broadway
Albany, New York 12207-2997

Re: Star Lake Water Improvement Project Drinking Water State Revolving Fund

Dear Mr. Driscoll:

The Towns of Fine and Clifton, located wholly within the Adirondack Park in the St. Lawrence County, have experienced devastating economic decline over the last 30 years with the loss of over 2000 jobs resulting from the closure of the Jones & Laughlin Steel Mill in the late 1970s and the most recent closure of the Newton Falls Paper Mill. In addition to the economic decline of the region, the Towns have struggled with water shortages and infrastructure problems that threaten public health and the few businesses and institutions that remain in these communities including a publically owned golf course, grocery store, bank, pharmacy, school and hospital.

The Town of Fine has had to declare water emergencies in the two past years resulting in putting unfiltered water into the drinking water system to meet the system demands. Additionally, in the neighboring Town of Clifton, the Woodhaven water system is aged and in need of replacement. The Woodhaven water system consists of one well, and severely restricted water piping. The lack of redundancy, condition of the infrastructure and restricted water piping have led to often extended periods of time with no water service to the area. Although not specifically addressed with this project, a future phase could address issues of Significant Non-Compliance for Disinfection Byproducts in the hamlet of Newton Falls, located just three miles from the Woodhaven district in the Town of Clifton. With the Newton Falls Mill closure, the small water system is losing 50 EDUs of demand and is significant oversized to meet the small residential needs.

This letter is to provide support for this much needed community infrastructure project. Without grant funds and no interest loan from the Drinking Water State Revolving Fund, residents of the Towns will not be able to finance the improvements. Delaying this project will lead to further economic decline in the region and a potential public health emergency.

Sincerely,

James W. Wright
Executive Director

