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# Point Reyes Station, Toby's Playground
# Wastewater Treatment Needs Assessment

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Sherwood has prepared this report to present the results of the wastewater usage wastewater capacity projections for visitors to Point Reyes Station in Marin County. This report quantifies the broader need for public restrooms in Point Reyes Station, calculating the actual wastewater demand by using wastewater pump out data from the existing restroom at Toby's Playground. The additional restroom and wastewater treatment capacity could be accommodated at the nearby Mesa Lot, which the County has plans to develop. The work performed in this report will build upon the additional infrastructure needs defined in the Visitor Needs Assessment for West Marin prepared by AECOM in 2017. This technical letter will also present Sherwood's assessment of alternatives for connecting the existing restroom infrastructure to the Mesa Road lot via a pipeline, and summarize Marin County's requirements for alternative treatment systems.

**Wastewater System at Toby's Playground**

The existing restroom site is located on the Northwest corner of the intersection of Mesa Road and Toby Street and consists of public space, including a small parking lot, play area, and restroom building. The building consists of three flush-toilet and sink stalls, and one stall which is being used as storage. There are also four drinking fountains and one water fill station. The wastewater is collected and treated via an onsite wastewater treatment system (OWTS).

The existing treatment system consists of a 2,000 gallon septic tank, a 2,000 gallon duplex dosing tank, a 1,500 gallon recirculation tank, and two Orenco AdvanTex® AX-20 units which treat wastewater to secondary treatment standards before disposal to an approximately 3,500 sq. ft. leach field system within the parcel. **The existing system is designed for an average daily flow of 450 gallons per day (gpd) and a 900 gpd peak flow.**

Shortly after installation in 2008, the system failed due to overuse. The capacity of the leach field is frequently exceeded due to high demand from tourism in the region. Portable toilets have been brought in to serve this additional capacity, however due to this heavy use, the septic tank is used as a holding tank and pumped out when full, approximately twice per week. This report estimates the total wastewater flow of the system by analyzing the pumping data from the leach field, septic tank, and portable restrooms, and projects these flows by 30 years to estimate the additional capacity needed for development in the future.

**Site Visit Information**

- Sherwood visited the site in January 2021 and documented the current number of portable restrooms. Photos from this site visit are included in Attachment A.

**Basis of Evaluation**

In August 2017, AECOM prepared a Visitor Needs Assessment for West Marin (Assessment). The scope of the Assessment report is for the entire region of West Marin, generally considered to be the area West of Muir Beach and Nicasio, but includes individual restroom demand forecasts to predict additional infrastructure needs. One of the individual restroom forecasts includes Toby's Playground in Point Reyes Station. This report found that although most nearby restaurants can provide sufficient capacity for restroom needs, some businesses in the area direct customers to the restroom at Toby's Playground, where capacity is often exceeded. Day-use facilities in the area, such as Nick's Cove, also often supplement their OWTS capacity with portable restrooms.

The report identified locations in the vicinity of Toby's Playground which could support additional parking and restrooms. Several sites, which fit most evaluation criteria, were mapped as having a high potential for liquefaction and could not be considered for wastewater disposal. This includes a vacant lot at the corner of B Street and Highway 1 that will be developed as a parking lot. The County of Marin Local Agency Management Plan (LAMP) policies, which govern OWTS, also require septic systems to be more than 50' away from any liquefaction prone soils.

The Assessment estimated existing flows to the OWTS. At the time of the report, AECOM stated there were five standard and one ADA portable restroom, and four flush toilets. During Sherwoods site visit, there were only three flush toilets in use, the fourth stall is a storage and janitorial area. There were four standard and two ADA portable restrooms.

The Assessment stated that the OWTS is designed for an average daily flow of 450 gpd, with an actual usage of nearly 1,000 gpd for the leach fields. In addition to the flush toilet demand, there was a portable restroom use of 1,700 uses/week in spring/summer and 500 uses/week in winter. Total wastewater flows, calculated in the Assessment using OWTS pump out and leach field data, are shown in Figure 1. This does not include flow calculated from portable toilet use on site, which were not included in the Assessment usage volumes.

**Figure 23: December 2015 (Winter Months Usage)**

| Total Usage | Designed Peak Flow | Average Pump out | Average Leachfield |
|---|---|---|---|
| 1,493 gpd | 900 gpd | 517 gpd | 976 gpd |

*Source: Questa Engineering July 2016*

**Figure 24: July 2015 (Summer Months Usage)**

| Total Usage | Designed Peak Flow | Average Pump Out | Average Leachfield |
|---|---|---|---|
| 1,986 gpd | 900 gpd | 1,010 gpd | 976 gpd |

*Source: Questa Engineering July 2016*

Figure 1: AECOM Assessment results.

In addition to calculating existing flows, the Assessment projected restroom demand under low, medium, and high growth scenarios. Under the high scenario, additional wastewater demand is expected to increase by 35% between 2020 and 2050.

Additional conclusions of the study were that seasonality is a major factor in tourism to the project site. Capacity may be sufficient during slower periods but is not in summer months or during events. Furthermore, although additional demand may exist for restrooms, the ability to visit a site and access restrooms is also constrained by parking availability. AECOM recommended an additional study to investigate the relationship of these issues.

Based on discussions with the County, and the results of the AECOM study, it's clear that actual use of the Point Reyes restroom exceeds the capacity of the treatment system and leach field. Below, Sherwood has used recent monitoring and pumping data to estimate the existing flows and projected them 30 years to the year 2052 using the AECOM visitor and wastewater projections. These values are presented below and exceed the flows estimated by the AECOM assessment.

**Data provided by County**

The data provided is broken up into several parts: septic tank, leach field, and portable toilet data. The first part is the septic tank pump out invoices that have been provided from July 2020 to June of 2021 by City Sewer Pumping, Inc. These invoices account for the quantity of pumpouts for the 2,000 gallon septic tank from June 2020 to June 2021. The septic tank data is summarized in Table 1. Volume pumped from septic tanks and sent to leach fields peaks in the spring, and is lowest during the winter months. The volume pumped from toilets peaked in the fall, but was also lowest during the winter months.

A peaking factor of 3.0 was applied to the maximum day flows to account for the fact that maximum volumes typically occur over weekends or during special events. In the data provided, actual maximum flows were likely not captured since only average monthly data was available.

Table 1. Septic Tank Pumpout Data (June 2020-June 2021)

| **Septic Tank Pump Out[1]** | | |
|---|---|---|
| **Month** | **Unit** | **Average Flow** |
| January | gpd | 516 |
| February | gpd | 500 |
| March | gpd | 581 |
| April | gpd | 867 |
| May | gpd | 645 |
| June | gpd | 533 |
| July | gpd | 645 |
| August | gpd | 581 |
| September | gpd | 400 |
| October | gpd | 258 |
| November | gpd | 400 |
| December | gpd | 387 |

| | | |
|---|---|---|
| **AA Flow** | **gpd** | **526** |
| **Max Average Day Flow** | **gpd** | **867** |
| **Max Day Flow[2], Peaking Factor** | **gpd** | **2,600** |
| *[1]Source: Septic Tank pumping Data, City Sewer Pumping, Inc*<br>*[2] Peaking Factor = 3.0* | | |

The second part of the data is the pumping to the leach fields, as provided by the monitoring reports from Marin County Environmental Health Services. This data accounts for the total discharge to the leach fields from May 2015 through May 2019, and is presented in Table 2. Leach field discharge is highest in the summer and lowest in the winter months.

Table 2. Annual Average Leach Field Discharge (May 2015- May 2019)

| **Discharge to Leach Fields[1]** | | |
|---|---|---|
| **Month** | **Unit** | **Average Flow[2]** |
| January | gpd | 577 |
| February | gpd | 655 |
| March | gpd | 641 |
| April | gpd | 492 |
| May | gpd | 1,222 |
| June | gpd | 882 |
| July | gpd | 882 |
| August | gpd | 914 |
| September | gpd | 732 |
| October | gpd | 558 |
| November | gpd | 462 |
| December | gpd | 438 |
| **AA Flow** | **gpd** | **705** |
| **Max Day Flow[3]** | **gpd** | **1,650** |
| **Max Day Flow[4], Peaking Factor** | **gpd** | **2,100** |
| *[1] Source: Marin County Environmental Health Services, Monitoring Report.*<br>*[2] Source data is based on monthly data from 2015-2019.*<br>*[3] Peak flow occurs in March 2017*<br>*[4] Peaking Factor = 3.0* | | |

The portable toilets are also included in this study, as they account for extra waste that is not captured by the current OWTS. Cleaning invoices have been provided by United Site Services, which provide the number of restrooms onsite and how often they are pumped out. The invoices are provided from June 2020 through June 2021, and the data gathered is found in Table 3. During the site visit in 2021, there were two standard and three ADA compliant portable toilets on site. Portable toilet pump out volumes were converted to a flush toilet volume using a factor of 3.8. This was calculated by assuming there are 0.4 gallons of volume per portable toilet use (Source: 2017 AECOM Visitor Needs Assessment) and the equivalent use of a flush toilet would generate 1.28 gallons of flushing volume plus 0.5 gal/min of handwashing water for 0.5 minutes, or 0.25 gal. (Source: Marin County CalGreen checklist).

Table 3. Portable Toilet Pump Out Data (June 2020-June 2021)

| **Portable Toilet Pump Out** | | |
|---|---|---|
| **Month** | **Unit** | **Average Flow[2]** |
| January | gpd | 340 |
| February | gpd | 376 |
| March | gpd | 203 |
| April | gpd | 529 |
| May | gpd | 685 |
| June | gpd | 443 |
| July | gpd | 497 |
| August | gpd | 685 |
| September | gpd | 708 |
| October | gpd | 512 |
| November | gpd | 351 |
| December | gpd | 340 |
| **AA Flow** | **gpd** | **472** |
| **Max Average Day Flow** | **gpd** | **708** |
| **Max Day Flow[3], Peaking Factor** | **gpd** | **2,800** |

*[1] Source: United services cleaning invoices.*
*[2] Converted to flush toilet volume using a factor of 3.8.*
*[3]Calculates max flow by assuming that the portable toilet tanks are filled over a weekend time period.*

The sum of flow from the septic tank, leach field, and portable restrooms provides the basis for estimating the total wastewater flow of the project.

Table 4. Existing (2022) wastewater flows calculated at Toby's Playground

| | **Units** | |
|---|---|---|
| Average Annual | gpd | 1,700 |
| Maximum Day | gpd | 3,200 |
| **Maximum Day, Peaking Factor** | **gpd** | **5,100** |

The analysis would benefit from additional data pre-2020 which would not include the impact that COVID-19 may have had on visitor numbers.

**Projections**

The 2017 AECOM Visitor Needs Assessment projects visitation at Point Reyes playground up to the year 2065. Here, Sherwood projects the flows over a 30-year period for planning purposes. While the report had low, medium, and high projections, medium projections were used in this analysis. The Assessment did not take into account the impact that parking may have on visitation and suggested further study, therefore visitation may be limited by parking. These projections were then applied to the existing flows calculated based on current pumping records for the septic tank, portable restrooms, and leach field.

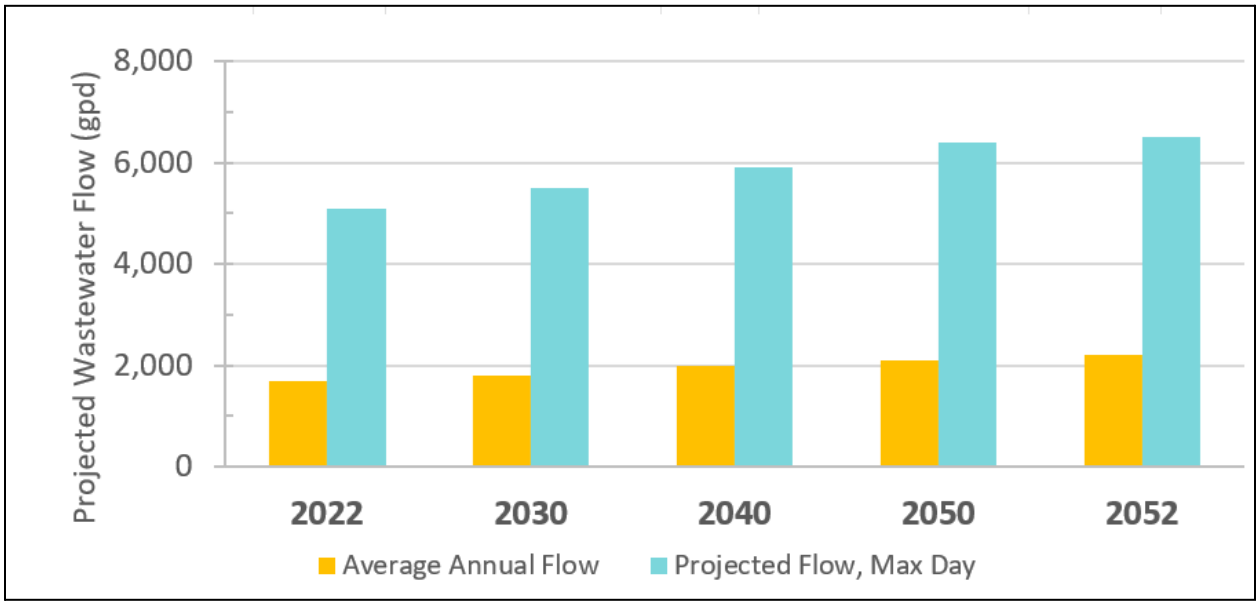


Figure 2: Wastewater Flow Projections over 30 years.

The existing wastewater flows, projected based on AECOM needs projections, are shown in Table 5. These projections assume that flow will increase directly proportional to visitation.

Table 5. Point Reyes Playground Flow Projections based on Visitation

| Year | Ratio of Additional Wastewater Demand Forecast (Medium estimate)[1] | Wastewater Flow Average Annual (gpd) | Wastewater Flow Maximum Day (gpd) |
|---|---|---|---|
| 2022[2] | 1.01 | 1,700 | 5,100[3] |
| 2025 | 1.09 | 1,800 | 5,500 |
| 2035 | 1.18 | 2,000 | 5,900 |
| 2045 | 1.27 | 2,100 | 6,400 |
| 2052[2] | 1.34 | 2,200 | **6,500** |

*[1]Source: West Marin Visitor Needs Assessment, 2017, Figure 27*
*[2] Values for 2022 and 2052 were interpolated from values provided in Figure 27.*
*[3] Existing 2022 flow estimated from Sherwood calculations above.*

**Proposed System**

*Flow Capacity*

To meet the capacity needs of the restroom for the next 30 years, the wastewater treatment system should be designed to meet a maximum day flow of 6,500 gpd. The system will see 2,200 gpd of flow on an average annual basis. Sherwood recommends that the treatment and disposal systems be sized for up to 8,000 gpd daily flow, which represents a factor of safety of 1.25.

Sherwood will develop an alternatives analysis to present several options for wastewater treatment and disposal to meet this expanded capacity. One proposed option is for tertiary treated wastewater with 100% disposal via subsurface drip irrigation, along with a redundant 100% leach field capacity.

Composting toilets are being considered as an alternative and will be presented as part of the alternatives analysis study. If used, the design would consider different metrics other than flow to calculate the capacity of a dry sanitation system, such as people per day equivalents, or restroom uses per day.

*Infrastructure Considerations*

Development on nearby parcels acquired by the County may also be served by the proposed treatment system at the restroom. The current restroom location at Toby's Playground, shown in Figure 2, is parcel 119-260-02 and the parcel for development, Mesa Lot, is 119-260-03.


Figure 3. Parcel map in Point Reyes Station

The pipeline from the development to the proposed treatment system will require either development in the right-of-way (ROW) or an easement on the adjacent parcel.

The features of these parcels are gently sloping (upward away from road) open fields with no structures. Large trees are located near the road. There is a fence located around the affordable housing wetland and conservation area, but no physical boundary to the affordable housing parcel to the northwest.

The easement process will require an agreement with the property owner. The County has a good relationship with the owners of affordable housing parcel. The process requires a real estate lawyer and surveyor, who then records the easement with the County to become part of the property title.

Sherwood also reviewed the existing utility maps to determine the feasibility of installing a small force main in Mesa Road ROW. Potential conflicts include the existing potable water piping, stormwater collection, and irrigation lines. As shown on the Toby's Playground as-builts, the potable water service is located on the Northwest side of the site, along Toby Street. This line tees off a water line shown in Mesa Road. If a wastewater disposal line is designed to reach a new disposal area, it will require a 10' setback from any potable water line. There is also a fire hydrant on Mesa Road in front of the restroom, but the pipe routing is not shown on Marin Maps. Routing of these utilities should be investigated further if a force main is proposed in the road.

Additionally, there is a stormwater line that starts approximately 50 feet from the South corner of the existing restroom parcel. This collection line flows Northwest and would not interfere with alignment of a new disposal line.

Sherwood has assumed that PG&E transmission and telecommunication lines are all overhead, and there are no conflicts in the ROW.

*Level of Service Evaluation*

There are several site constraints that limit the area available for a potential wastewater treatment system and disposal area. Any treatment system or disposal on the proposed parcels should be outside the North Marin Water District (NMWD) zone of protection, which is a 1,600' radius around groundwater wells. The exception of this is subsurface irrigation with high-quality effluent, a disposal method which the NMWD has approved at the neighboring Coast Guard project. Additionally, the area North of the Mesa Lot is a wetland buffer. This leaves approximately 30,000 square feet (SF) available as shown on the site plan in Figure 3.

This area can accommodate a new treatment system and the required area for effluent disposal. An option for effluent disposal is subsurface drip irrigation with 100% redundancy via a leach field, which could also be accommodated. At the maximum day flows, and using the infiltration rates from percolation test data performed by Questa Engineering Corp. in 2021 for the nearby Point Reyes Coast Guard Housing project, Sherwood estimates 11,000 sq. ft. is needed for a leach field and 33,000 sq. ft. is needed for subsurface drip. Based on conversations Sherwood has had with the North Marin Water District, the subsurface drip system could be located within the NMWD buffer. Any area with either of these effluent disposal options cannot be developed with buildings or covered with impermeable material such as asphalt or concrete.


Figure 4. Site Plan and Constraints of Mesa Lot

**Regulatory Requirements**

Both Marin County and the state government contain specific regulatory measures that must be followed when designing an OWTS. The various regulations are described below.

*County Regulations*

Marin County Code, Chapter 18.06 and Chapter 18.07 provides the County Health Officer authority to create and implement regulations that ensure safe and proper waste disposal for any standard or alternative sewage disposal system. Chapter 18.06 and Section 800 of the Marin County Code also provides standard and alternative system design regulations specific to Marin County. Standard design regulation include allowable construction locations, groundwater and surface water features, septic tank construction standards, and other design criterias for OWTS. For alternative system designs, the Health officer may permit construction if either a standard system does allow for sanitary sewage disposal, or if an alternative system will protect the public health in a manner that is at least equivalent to a standard system. Alternative designs also require a renewable operating permit. The County Environmental Health Services (EHS) has drafted a Local Agency Management Program (LAMP). The Draft LAMP is reviewed by the San Francisco Bay Regional Water Quality Control Board for compliance with State OWTS policy.

The LAMP provides the County-specific requirements for OWTS design, as well as clarifies if the site for design falls in the defined Coastal Zone, deeming it outside of federal jurisdiction. This will require a coastal development permit prior to any construction of proposed designs. The Marin County Local Coastal Program is the primary document for all development within the Coastal Zone of the County, and will also be utilized for this design.

The LAMP includes several requirements for the protection of water quality. The County EHS requires detailed site evaluation to document suitable solid characteristics and depth for each OWTS installation. In addition, site evaluations for geologic factors and groundwater conditions are required.

One conclusion of the 2017 AECOM Assessment is that there is a conflict between the requirements for portable toilets and the actual usage of portable toilets in West Marin. Regulations only allow short-term usage of portable toilets without a permit, and discussions with the County of Marin Environmental Health Services indicate that there is no permit process for long-term portable toilet use. There are many site throughout Marin with long-term portable toilet use, including the Toby's Playground site, which has used them since at least 2015.

*State Regulations*
The California State Water Resources Control Board implemented an OWTS policy in May of 2013 that establishes state-wide regulation and management measures for OWTS. It sets minimum standards and allows for individual counties and agencies to adopt their own standards through the LAMP. It allows for systems to contain flow rates up to 10,000 gallons per day, and can have additional standards if a project is close to impaired water bodies, such as Tomales Bay. The California Coastal Act may require Coastal Development Permits.

*Project Specific Regulations*
There may be specific regulations imposed based on the wastewater treatment technology selected. For example, if an engineered wetland or composting toilets are used.

*Regulatory environment of composting toilets*
Sonoma County is the only county in California that has a permit pathway for composting toilets. However, the Marin County Parks Department has asked Sherwood to explore the use of composting toilets at a County site in Point Reyes Station. Sherwood will soon be looking into case studies and discussing them as an alternative for the site. The community seems invested and interested in this possibility.

**Conclusions**
The existing design of the treatment system at Toby's Playground is undersized by several thousand gallons per day. On top of this, a wastewater flow increase of up to 50% is expected over the next 30 years due to an increased projection of visitors to the area. Sherwood recommends additional wastewater capacity of 7,100 gpd, for a total of approximately 8,000 gpd including the existing OWTS and leach field at Toby's Playground. It is feasible to add capacity via additional restrooms and disposal areas on the nearby County-owned Mesa Lot. Other development of this parcel may be partially limited by the disposal areas.

The next steps for this project are:

- Investigate the potential for wastewater reuse on site via subsurface drip.
    - Note that reuse for toilet flushing is not allowed in Marin County currently.

    - Determine how much area would be needed if assuming a type of landscaping
        - Leachfields that can meet 100% of disposal volume are still needed for discharge during periods wet weather
- Prepare a review of Case Studies for similar-sized decentralized wastewater treatment projects, with a focus on green, cutting-edge technologies.
- Prepare an alternatives analysis which will evaluate several wastewater treatment and disposal technologies.
- Conceptual design of selected technology with schematic and cost estimate.
- Prepare material for, and participate in, two Community Meetings. The first one, which will introduce the scope of work, occurred on Tuesday, June 28, 2022. The second is scheduled for late October and will present the conceptual design.

**Attachment A: Photos from site visit, June 21, 2021**


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