Underground Injection Control Permit
Fact Sheet

Permit Summary	
Applicant	Yale University
Permit No.	UI0000524
Application No.	202306082
Date Application Received	August 23, 2023
Date of Public Notice of Application	July 28, 2023
Location Address	Yale Divinity School 423 Prospect Street New Haven, CT 06511
Facility Contact	Whyndam Abrams, CHMM Yale University Environmental Health & Safety Phone number: 203-432-2093 Email: Whyndam.abrams@yale.edu
Discharge Monitoring Report Contact	Whyndam Abrams, CHMM Yale University Environmental Health & Safety Phone number: 203-432-2093 Email: Whyndam.abrams@yale.edu
Mailing Address	135 College Street, Suite 100 New Haven, CT 06510
Permit Term	10 Years
Permit Type	New
Permit Category	UIC Class V Injection Well
Treatment System Description	5W12 Advanced Treatment
Ownership	Private
Compliance Schedule in Draft Permit	No
Compliance Schedule in Previous Permit	No
Receiving Waterbody	Groundwater in the South Central Shoreline
Water Quality Classification(s)	GB
Treatment System Location(s)	DSN A01
DEEP Staff	Antoanela Daha, Environmental Engineer 860-424-3876 Email: Antoanela.daha@ct.gov

Contents

Section 1.0 Permit fees

Discharge Code: 312000a Treatment System: DSN - A01 Annual Fee: $1,110

Section 2.0 Nature of business generating discharge

Yale University has constructed a new residential graduate school building incorporating a range of water conservation and wastewater reuse measures. The design includes: low-flow plumbing fixtures, the use of treated wastewater for toilet and urinal flushing, and a subsurface wastewater drip irrigation system with a discharge to the groundwater. Wastewater that does not meet applicable permit effluent limits will be directed to the sanitary sewer system. This proposal is consistent with the applicant's objective to design and construct a water-efficient building in pursuit of the distinction the "Water Petal" under the Living Building Challenge, a sustainability framework that emphasizes responsible water use and reuse.

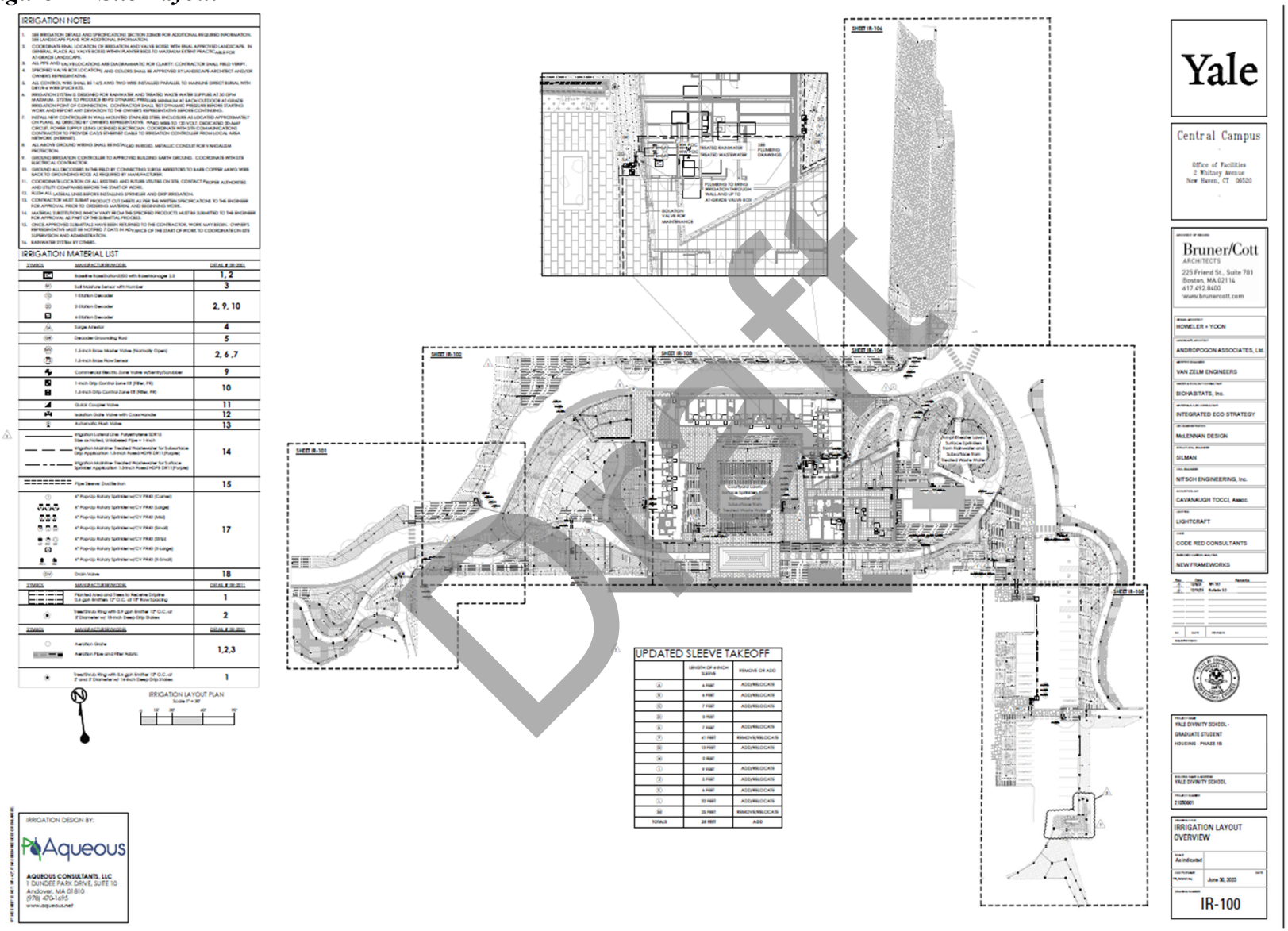
Section 3.0 Application submittal information

On August 23, 2023, the Department of Energy and Environmental Protection ("DEEP") received an application (Application No. 202306082) from Yale University ("the Permittee", "the Applicant", "the facility") located in City of New Haven, Connecticut for the issuance of a new UIC permit.

Consistent with the requirements of Section 22a-6g of the Connecticut General Statutes ("Conn. Gen Stat."), the Permittee published a Notice of Permit Application in the New Haven Register on July 28, 2023.

DEEP determined the application was administratively sufficient and issued a Notice of Sufficiency on October 25, 2023. The technical review phase started January 17, 2024.

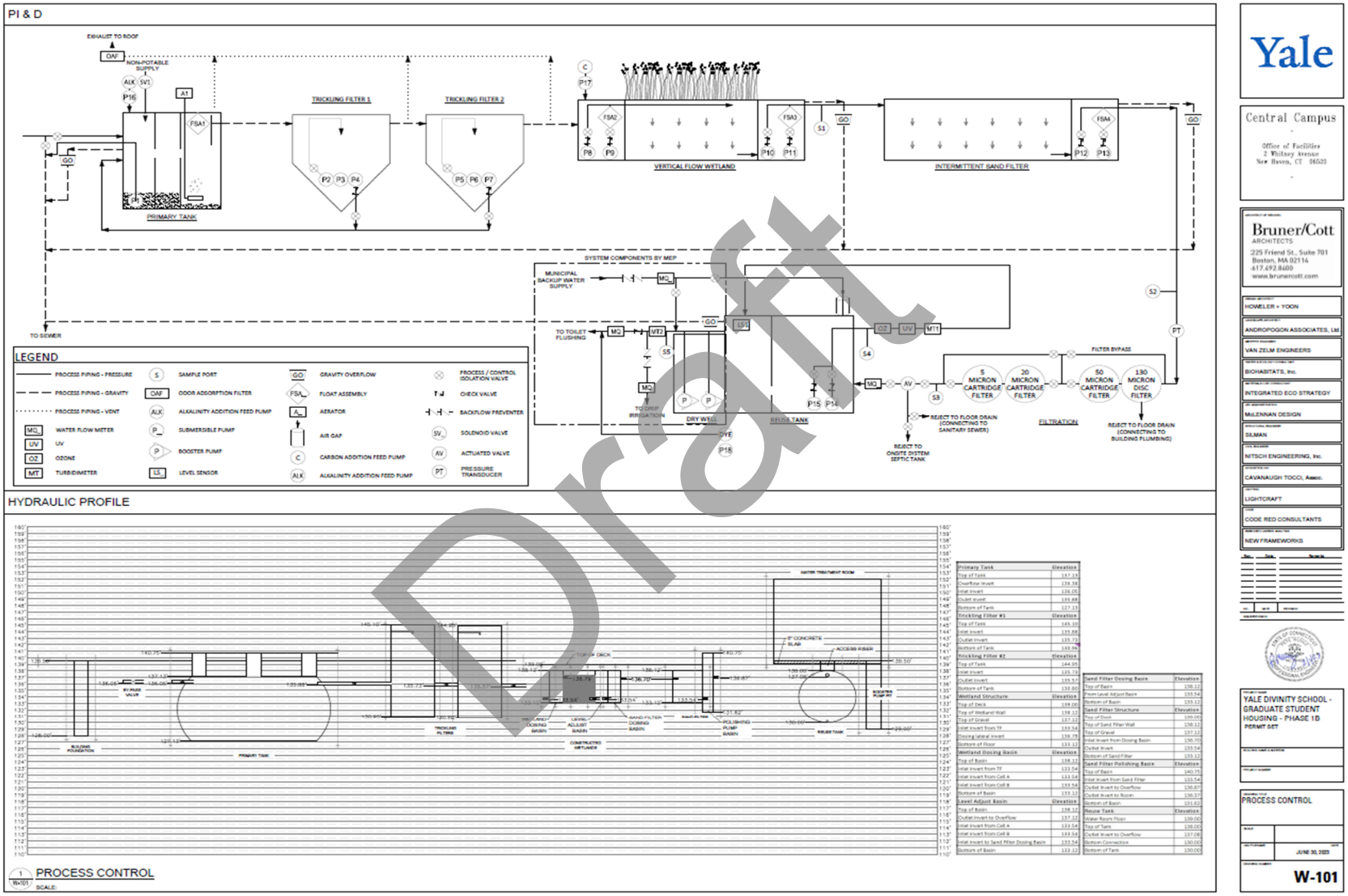
Figure 1 – Site Layout



The Applicant seeks authorization to treat and discharge wastewater for the following:

Discharge serial number	Proposed average daily flow (gpd)	Proposed maximum daily flow (gpd)	Building served	Treatment type
A01	*2,600*	*3,900 (Treatment Capacity)*	*Yale Divinity School Dormitory*	☐ Conventional Treatment ☒ Advanced Treatment ☒ Reuse
		2,000 (drip irrigation from April 1-October 31)		
		800 (year round re-use to toilets and urinals)		Three stages: pretreatment tank, two trickling filters in series, two units of constructed wetlands and a sand filter with effluent reuse to toilets and urinals and seasonal discharge to drip irrigation system.
Total Site		3,900		The site is already connected to the City of New Haven POTW and the total flow to the site is covered by a different permit that is not subject to this application. The maximum flow associated with the building is 3,900 gallons per day. Any flows in excess of that will be directed to the POTW.

Figure 2. Flow Diagram



Section 4.0 Permit amendments & facility changes

The Regulations of the Connecticut State Agencies ("Regs. Conn. State Agencies") require that permittees notify DEEP and obtain written approval of any facility expansion or process change that may result in an increased or new discharge or constitute a new source, and of any expansion or significant changes made to a wastewater collection system, treatment system, or its method of operation in accordance with Regs. Conn. State Agencies Section 22a-430-3(i). These regulatory provisions are commonly referred to as "3(i) determinations". DEEP will review the notification and determine if the change can be implemented under the current permit or if the requested change requires a permit modification to protect waters of the State in accordance with Regs. Conn. State Agencies Section 22a-430-4(p).

There are no changes to the facility, as this is a new application.

Section 5.0 Special site considerations

5.1 Federally recognized Indian land

As provided in the permit application, is the site located on federally recognized Indian land?
☐ Yes ☒ No

5.2 Coastal area/coastal boundary

Is the activity located within a coastal boundary as defined in Conn. Gen. Stat. 22a-94(b)?
☐ Yes ☒ No

5.3 Endangered species

As provided in the permit application, is the site located within an area identified as a habitat for endangered, threatened or special concern species according to the *State and Federal Listed Species and Natural Communities Map*?
☐ Yes ☒ No

5.4 Aquifer protection areas

As provided in the permit application, is the site located within a protected area identified on a Level A or B map?
☐ Yes ☒ No

5.5 Conservation or preservation restriction

As provided in the permit application, is the property subject to a conservation or preservation restriction?
☐ Yes ☒ No

5.6 Public water supply watershed

As provided in the permit application, is the site located within a public water supply watershed?
☐ Yes ☒ No

Section 6.0 Compliance history

Is the Permittee subject to an ongoing enforcement action? ☐ Yes ☒ No

Section not applicable.

Section 7.0 Application review

DEEP's technical review of the application identified that the proposed project includes elements not typically addressed under existing permitting frameworks, including onsite wastewater treatment with residential reuse for toilet flushing. The proposed subsurface drip irrigation system qualifies the discharge as a regulated Underground Injection Control (UIC) activity.

Due to the nature of the proposed wastewater reuse system and its application on a residential scale, the Department identified the need for additional information and clarification. The technical review focused on reconciling the proposed sustainable design with standard UIC regulatory requirements.

The Department issued Requests for Additional Information ("RFAIs") to the applicant on March 19, 2024, August 22, 2024, and June 4, 2025, addressing design aspects including flow derivation, implementation of the discharge to the sanitary sewer, water balance, inconsistencies in reported concentrations across application attachments, drip irrigation design and soil analysis, pathogen inactivation, and phosphorus evaluation.

Through this iterative review process and multiple technical exchanges, the Engineering Report submitted with the application and supporting documentation were revised and supplemented to address Department comments. These revisions clarified system design, treatment performance, reuse water quality controls, monitoring requirements, and operational safeguards, including diversion of non-compliant effluent to the sanitary sewer.

As a result of the project-specific design and regulatory considerations, the review required the development and application of policy considerations for residential water reuse, as well as the establishment of project-specific permit terms and conditions to ensure protection of public health and the environment.

Based on the additional information provided and the incorporation of these conditions, DEEP has determined that the application is technically sufficient and consistent with applicable regulatory requirements.

7.1 Site investigation

Based on the review of the application materials, information provided by the applicant and follow-up discussions, it was determined that the site will be able to accept and disperse the seasonal discharge of treated wastewater based on the following determinations:

1. A geotechnical and environmental evaluation of the site was performed by Haley & Aldrich (December 2021). The subsurface investigations indicate that bedrock and groundwater are present at depths greater than 9 feet in the proposed irrigation areas.

2. The native soils at the site are classified as Hydrologic Soil Group ("HSG") D which are not favorable for drip irrigation. The applicant proposes to replace native soils within the irrigation areas with engineered fill designed to function as HSG Group A (loamy sand or equivalent) to enhance infiltration capacity.
3. The proposed subsurface drip irrigation system will be installed within the engineered soil layer at a depth of approximately 6 inches below grade. Wastewater will be applied at rates of 0.24 to 0.64 inches per hour, substantially lower than the estimated hydraulic conductivity of the engineered soils (11 to 25 inches per hour), ensuring infiltration without surface breakout or mounding. Wastewater will be distributed across 52 zones, with each zone receiving a single daily dose of short duration (approximately 4 to 11 minutes), limiting hydraulic loading to the shallow root zone.
4. The system will be equipped with soil moisture sensors and climate-based controls to limit irrigation to periods when conditions warrant it. The maximum design flow is 2,000 gallons per day; however, actual flows are expected to be lower and variable.
5. Based on the proposed design, including the use of engineered permeable soils, low application rates, and controlled dosing, site testing typically witnessed by DEEP for subsurface sewage disposal systems was not required.
6. Treated wastewater will be disinfected prior to reuse, and turbidity will be continuously monitored. Wastewater not meeting established quality criteria will be diverted to the sanitary sewer.

Overall, the proposed design, including engineered soils, low application rates, controlled dosing, and automated monitoring, provides reasonable assurance that the system, if operated in compliance with the permit terms and conditions should operate as intended without adverse impacts to groundwater or surface conditions.

Section 8.0 Basis for limitations, permit standards or conditions

In accordance with section 22a-430 of the Regs. Conn. State Agencies, DEEP's "Guidance for Design of Large-Scale On-Site Wastewater Renovation Systems" (February 2006), and DEEP's review of the permit application, site investigation, additional administrative record, "Connecticut Reuse Design Manual" (March 2026), and pollutant analyses of the wastewater, a determination has been made that there is a need for an alternative wastewater treatment system to protect the ground water from pollution. The alternative wastewater treatment system is designed to treat wastewater and remove pollutants before being re-used for toilets and urinal flushing or discharged to the drip irrigation system.

8.1 Alternative wastewater treatment

The wastewater treated though the alternative treatment plant was designed to meet the following parameters prior to entering the drip irrigation system:

- Average daily flow: 2,600 gallons per day
- Maximum daily flow: 3,900 gallons per day
- Daily minimum and maximum: pH: 6.0 – 9.0 s.u.

Discharge to the drip irrigation system shall be limited to the period from April 1 through October 31 and must meet the following parameters:

- Maximum daily flow: 2,000 gallons per day

Parameter	Units	Average Daily Flow Limit	Maximum Daily Flow Limit
Biochemical Oxygen Demand$_{5\text{-day}}$	mg/L	20	30
Total Suspended Solids	mg/L	20	30
Total Nitrogen	mg/L	10[3]	Report
Ammonia	mg/L	Report	Report
Nitrate Nitrogen	mg/L	Report	Report
Nitrite Nitrogen	mg/L	Report	Report
Total Kjeldahl Nitrogen	mg/L	Report	Report
Total Phosphorus	mg/L	Report	Report
pH (Day of Sampling)	S.U.	NA	6.0 – 9.0
Alkalinity	mg/l	Report	Report
Turbidity	NTU	Report	Report
Total Coliform	CFU/100ml	200	400

Monitoring requirements for additional parameters, such as nitrate, have been incorporated into the permit to quantify total nitrogen loading and to validate the design criteria and year-round operational efficiency of the treatment system. These discharge limits are established to ensure the continuous hydraulic performance of the system and maintain consistency with established standards for similar permitted discharges across the State of Connecticut.

8.2 Reuse wastewater treatment
The wastewater discharging to the reuse treatment plant was designed to meet the following parameters:

- Average daily flow: 600 gallons per day
- Maximum daily flow: 800 gallons per day
- Daily minimum and maximum: pH: 6.0 – 9.0 s.u.

Parameter	Units	Average monthly limit	Maximum daily limit
Biochemical Oxygen Demand$_{5\text{-day}}$	mg/L	10	10
Total Suspended Solid	mg/L	5	5
Total Nitrogen	mg/L	10[1]	
Turbidity	NTU		2
Total Coliform	CFU/100ml	2.2[2]	14
Disinfection[3]	mJ/cm2	>100	>100

Footnotes:

1. Limit is based on a twelve-month rolling average.
2. Seven-day median.
3. The proposed disinfection is ultraviolet (UV).

Monitoring requirements for additional parameters, such as nitrate, have been incorporated into the permit to quantify total nitrogen loading and to validate the design criteria and year-round operational efficiency of the treatment system. These discharge limits are established to ensure the continuous hydraulic performance of the system and maintain consistency with established standards for similar permitted discharges across the State of Connecticut.

8.3 Sampling frequency, type, and reporting

Table A: Domestic wastewater: influent to the treatment system

Table A **Domestic wastewater: Influent to the treatment system**					
Discharge Serial No. A01			**Monitoring Location:** ST2[1]		
Wastewater Description: Domestic sewage influent to the Bioclere					
Monitoring Location Description: Description: Outlet of the pre-treatment tank					
Flow/Time Based Monitoring					
Parameter	**Units**	**Average Daily Flow Limit**	**Maximum Daily Flow Limit**	**Sample Type**	**Sample Frequency**
Flow Rate (Average daily)[2]	gpd	2,600	3,900	Totalizer	Continuous
Instantaneous Monitoring					
Parameter	**ICIS Code**	**Units**	**Average Monthly Limit[3,4]**	**Sample Type**	**Sample Frequency[5]**
Biochemical Oxygen Demand$_{5day}$	00310	mg/L	Report	Grab	Twice per month
Total Suspended Solids	00530	mg/L	Report	Grab	Twice per month
Total Kjeldahl Nitrogen	00625	mg/L	Report	Grab	Twice per month
pH	00400	S.U.	Report[4]	Grab	Twice per month

Footnotes:

1. Monitoring location as depicted on as-built plan.
2. For this parameter, the Permittee shall maintain at the facility a record of the total flow for each day of discharge and shall report on the DMR the Average Daily Flow and the Maximum Daily Flow for each month.
3. "Report" in the limits column on this monitoring table means a limit is not specified, but monitoring is required, and a value must be reported on the DMR.
4. pH shall be reported as the daily minimum and daily maximum values for the month.
5. Sample shall be taken twice per month on two different calendar days.

Table B: Intermediate Process

Table B Effluent Intermediate Process					
Discharge Serial No.: A01				**Monitoring Location:** J	
Wastewater Description: Effluent Intermediate Process					
Monitoring Location Description: Effluent from the second Bioclere Unit					
Instantaneous Monitoring					
Parameter	**ICIS Code**	**Units**	**Average Monthly Limit[1]**	**Sample Type**	**Sample Frequency[2]**
pH[3]	00400	S.U.	Report	Grab	Twice per month
Temperature	00011	º F	Report	Grab	Twice per month
Alkalinity	00410	mg/L	Report	Grab	Twice per month

Footnotes:

1. "Report" in the limits column on this monitoring table means a limit is not specified, but monitoring is required, and a value must be reported on the DMR.
2. Sample shall be taken twice per month on two different calendar days.
3. pH shall be reported as the daily minimum and daily maximum values for the month.

TABLE C- Reuse to Toilets and Urinals

TABLE C- Reuse to Toilets and Urinals (Required to be Reported in NetDMR)						
Discharge Serial No. A01				**Monitoring Location:** E		
Wastewater Description: Treated effluent from sand filter						
Monitoring Location Description: Reuse Tank						
FLOW/TIME BASED MONITORING						
Parameter	**ICIS Code**	**Units**	**Average Daily Flow Limit**	**Maximum Daily Flow Limit**	**Sample Type**	**Sample Frequency**
Flow Rate (Average daily)[1]	00056	gpd	600	800	Totalizer	Continuous
Instantaneous Monitoring						
Parameter	**ICIS Code**	**Units**	**Average Monthly Limit[2]**	**Maximum Daily Limit[4,5]**	**Sample Type**	**Sample Frequency[4]**
Biochemical Oxygen Demand$_{5\text{-day}}$	00310	mg/L	10	10	24-hr composite	weekly
Total Suspended Solids	00530	mg/L	5	5	24-hr composite	weekly
Total Nitrogen[8]	00600	mg/L	10[3]	Report	24-hr composite	monthly
Ammonia	00610	mg/L	Report	Report	24-hr composite	monthly
Nitrate Nitrogen[7]	00620	mg/L	Report	Report	24-hr composite	monthly
Nitrite Nitrogen	00615	mg/L	Report	Report	24-hr composite	monthly
Total Kjeldahl Nitrogen[6]	00625	mg/L	Report	Report	24-hr composite	monthly
Total Phosphorus	00665	mg/L	Report	Report	24-hr composite	monthly
pH, Minimum[5] (Day of Sampling)	61942	S.U.	NA	6.0	Grab	Online sensor
pH, Maximum (Day of Sampling)	61941	S.U.	NA	9.0	Grab	Online sensor
Alkalinity	00410	mg/l	Report	Report	Grab	weekly
Turbidity		NTU	Report	2	Continuous	Online sensor
Total Coliform		CFU/10	2.2	14	Grab	weekly

		ml				
UV Dose		mJ/cm2	>100	>100	Continuous	Online calculation

Footnotes:

1. For this parameter, the Permittee shall maintain at the facility a record of the total flow for each day of discharge and shall report on the DMR the Average Daily Flow and the Maximum Daily Flow for each month.
2. "Report" in the limits column on this monitoring table means a limit is not specified, but monitoring is required, and a value must be reported on the DMR.
3. Limit is based on a twelve-month rolling average.
4. Sample shall be taken twice per month on two different calendar days.
5. For the parameter pH, the daily minimum limit is 6.0 S.U. and the daily maximum limit is 9.0 S.U. For reporting purposes, report the minimum and maximum values for the month.
6. Total Kjeldahl nitrogen shall be analyzed in accordance with EPA Method 4500 in accordance with 40 CFR 136.
7. Nitrate Nitrogen shall be analyzed in accordance with EPA Method 4110 B-2020 in accordance with 40 CFR 136.
8. Total Nitrogen shall be determined by the summation of nitrate nitrogen, nitrite nitrogen and kjeldahl nitrogen (Total Nitrogen (TN)=TKN+NO_3-N+NO_2-N).

Table D **Drip Irrigation System April 1- October 31**

TABLE D- Drip Irrigation System April 1- October 31 (Required to be Reported in NetDMR)						
Discharge Serial No. A01				**Monitoring Location:** E		
Wastewater Description: Treated effluent from sand filter						
Monitoring Location Description: Reuse Tank						
FLOW/TIME BASED MONITORING						
Parameter	**ICIS Code**	**Units**	**Average Daily Flow Limit**	**Maximum Daily Flow Limit**	**Sample Type**	**Sample Frequency**
Flow Rate (Average daily)[1]	00056	gpd		2,000	Totalizer	Continuous
Instantaneous Monitoring						
Parameter	**ICIS Code**	**Units**	**Average Monthly Limit[2]**	**Maximum Daily Limit[4,5]**	**Sample Type**	**Sample Frequency[4]**
Biochemical Oxygen Demand$_{5\text{-day}}$	00310	mg/L	20	30	24-hr composite	weekly
Total Suspended Solids	00530	mg/L	20	30	24-hr composite	weekly
Total Nitrogen[8]	00600	mg/L	10^3	Report	24-hr composite	monthly
Ammonia	00610	mg/L	Report	Report	24-hr composite	monthly
Nitrate Nitrogen[7]	00620	mg/L	Report	Report	24-hr composite	monthly
Nitrite Nitrogen	00615	mg/L	Report	Report	24-hr composite	monthly
Total Kjeldahl Nitrogen[6]	00625	mg/L	Report	Report	24-hr composite	monthly
Total Phosphorus	00665	mg/L	Report	Report	24-hr composite	monthly
pH, Minimum[5] (Day of Sampling)	61942	S.U.	NA	6.0	Grab	Online sensor
pH, Maximum (Day of Sampling)	61941	S.U.	NA	9.0	Grab	Online sensor
Alkalinity	00410	mg/l	Report	Report	Grab	weekly
Turbidity		NTU	Report	Report	Continuous	Online sensor

Total Coliform		CFU/100ml	200	400	Grab	weekly
UV Dose		mJ/cm2	>100	>100	Continuous	Online calculation

Footnotes:

1. For this parameter, the Permittee shall maintain at the facility a record of the total flow for each day of discharge and shall report on the DMR the Average Daily Flow and the Maximum Daily Flow for each month.
2. "Report" in the limits column on this monitoring table means a limit is not specified, but monitoring is required, and a value must be reported on the DMR.
3. Limit is based on a twelve-month rolling average.
4. Sample shall be taken twice per month on two different calendar days.
5. For the parameter pH, the daily minimum limit is 6.0 S.U. and the daily maximum limit is 9.0 S.U. For reporting purposes, report the minimum and maximum values for the month.
6. Total Kjeldahl nitrogen shall be analyzed in accordance with EPA Method 4500 in accordance with 40 CFR 136.
7. Nitrate Nitrogen shall be analyzed in accordance with EPA Method 4110 B-2020 in accordance with 40 CFR 136.
8. Total Nitrogen shall be determined by the summation of nitrate nitrogen, nitrite nitrogen and total Kjeldahl nitrogen (Total Nitrogen (TN)=TKN+NO_3-N+NO_2-N).

Section 9.0 Groundwater monitoring requirements

To ensure that treated domestic wastewater does not result in groundwater pollution, monitoring is required at the perimeter of the designated Zone of Influence ("ZOI"). Pursuant to Regs. Conn. State Agencies Section 22a-426-7, all groundwater migrating beyond the ZOI must comply with the primary Maximum Contaminant Levels ("MCLs") established by the Commissioner of Public Health. Adherence to these standards ensures that discharges do not pose an unacceptable risk to public health and remain consistent with the State's anti-degradation policies.

9.1 Drip Irrigation Leaching System

In lieu of a conventional leaching system for subsurface discharge, the applicant proposes a subsurface drip irrigation system. The system will be installed within an engineered soil layer (loamy sand) at a depth of approximately 6 inches below grade, within the shallow root zone. Wastewater will be distributed over approximately 64,000 square feet of drip dispersal area across 52 zones, with each zone receiving a single daily dose for short duration (approximately 4 to 11 minutes), thereby limiting hydraulic loading to the shallow root zone.

9.2 Groundwater nitrogen calculation

The applicant did not provide a nitrogen dilution analysis consistent with the Department's standard nitrogen loading model. Such calculations were not required in this case because the proposed treatment system is designed to achieve a total nitrogen ("TN") concentration of approximately 10 mg/L prior to discharge to groundwater. As a result, nitrogen is not expected to exceed the applicable drinking water standard at the point of discharge.

In addition, the system includes operational controls to ensure compliance with permit effluent limits. If treated wastewater does not meet the required effluent quality, including nitrogen limits, the flow will be automatically diverted to the sanitary sewer, thereby preventing the discharge of non-compliant effluent to the subsurface.

Groundwater quality at the point of environmental concern must not exceed the drinking water MCL of 10 mg/L for nitrate, unless otherwise authorized. Given that the effluent total nitrogen concentration is expected to be consistent with this standard, and considering the low loading rates and controlled application associated with the drip irrigation system, it has been determined that a detailed nitrogen dilution analysis was not necessary.

9.3 Phosphorus (P) removal and soil sorption analysis

The Department utilizes a removal model for phosphorus in treatment system percolate which assumes 30% of phosphorus is removed within the septic tank and the biomat interface. The remaining phosphorus must be attenuated by the unsaturated soil zone beneath the leaching system. The unsaturated soil must demonstrate the capacity to sorb at least six (6) months of the phosphorus load.

Phosphorus Sorption Methodology

Step 1: Determine Total Equivalent Horizontal Area (A_h)

- A_h = Linear Feet x (Width + Sidewall Correction)

Step 2: Calculate Monthly Phosphorus Load (L_p)

- L_p = (Q x 3.785 x C_p) x 30.4 days

Step 3: Calculate Mass of Soil (M_s)

The Department assumes 50% of the area beneath the system is active for flow:

- M_s = 0.5 x A_h x D x Dry Unit Weight (converted to gm/cu. ft.)

Step 4: Determine Sorption Duration

$$\text{Months of Sorption} = \frac{(M_s \times S_v/100)}{L_p}$$

Variable	Description	Applicant Value	Units
Q	Design Average Daily Flow	2,000	GPD
L X W	Total linear feet of leaching units X Effective bottom width (inc. stone)	64,000	sf
D	Depth of unsaturated soil	10	ft
C_p	Effluent P concentration (est. X mg/L)	5	mg/L
S_v	P sorption value (from soil test)	9	mg/100g
W_d	Average dry unit weight of soil	75	lb/cu.ft
T_s	**Calculated Months of Sorption**	**1,063**	**Months**

- Total Monthly P Load: 1.19 x 10^6 mg
- Total Soil Sorption Capacity: 1.26 x 10^9 mg
- Sorption Duration: 1,063 months

Determination: The site meets the minimum 6-month sorption requirement and is satisfactory with respect to Phosphorus removal.

9.4 Groundwater pathogen inactivation and travel time analysis

The DEEP has established a performance objective of 5-$\log_{10}$ (99.999%) virus removal/inactivation before commingled wastewater reaches a sensitive receptor.

The removal occurs through physical processes such as filtration and adsorption, ion exchange processes, natural die-off and microbial antagonism. Inactivation is enhanced in aerobic conditions within the unsaturated soils beneath the leaching field.
Pathogens not removed in the unsaturated zone must be inactivated through natural attenuation in saturated soils. The DEEP requires a minimum travel time to ensure public health is safeguarded before effluent reaches a point of concern.

Calculation Methodology:
The relationship v = ((k x i) / n) must be used to determine velocity, where (n) is derived from established technical literature for the specific soil class found on-site.

To determine that these travel times are met, groundwater velocity **(*v*)** through the site's specific soil conditions is identified using the following equation:

$$v=ki/n$$

Once the velocity is known, the time (*t*) or required distance (*d*) is calculated using the relationship:

$$v=d/t$$

Site-Specific Demonstration:

The requirement to demonstrate time of travel through soils for pathogen attenuation is not necessary for this discharge, as pathogen removal is achieved through tertiary treatment with disinfection and enforceable effluent limitations, rather than reliance on subsurface soil processes.

Typical fecal coliform concentrations in raw domestic wastewater range from approximately 10^6 to 10^8 CFU/100 mL**.** The permitted effluent limits of the discharge to the subsurface of 200 CFU/100 mL (geometric mean) and 400 CFU/100 mL (maximum) correspond to an estimated average of 5 log reduction in fecal coliform concentrations. This level of removal reflects substantial and quantifiable pathogen reduction achieved through treatment processes prior to discharge, and is consistent with water quality standards.

Because compliance is demonstrated through routine effluent monitoring and enforceable numeric limits, pathogen control is verified directly at the point of discharge. In addition, the system includes an operational safeguard allowing for diversion of flow to the sanitary sewer in the event that effluent quality does not meet permit limits. This contingency ensures that non-compliant discharges are prevented**,** further reducing any reliance on subsurface attenuation mechanisms.

The design also provides approximately 8 to 9 feet of vertical separation to groundwater, exceeding typical minimum separation distances and providing an additional physical buffer.

While this separation offers secondary attenuation capacity, it is not relied upon as the primary means of pathogen removal.

Finally, the site is located within a groundwater-bearing (classified as GB area) area in downtown New Haven, where subsurface conditions may be heterogeneous and influenced by historical industrialization and urban infrastructure. Under these conditions, reliance on engineered treatment, performance-based standards, and compliance monitoring is more appropriate and protective than reliance on modeled soil travel times.

Given the low flow rates, infrequent application, treated effluent, and the urban context of the groundwater (classified as a GB area,) DEEP has determined that groundwater monitoring wells are not required at this time.

Section 10.0 Permit compliance schedule

Does the permit include a compliance schedule? ☒ Yes ☐ No

The proposed permit includes the following compliance schedules:
1) Record the permit in the town's land records;
2) Record the zone of influence in the town's land records;
3) Provide verification that the system was installed in accordance with the approved plans and specifications and all permit terms and conditions are met after the initial start-up; and
4) Submit the results of a detailed permit compliance audit every two years.

Section 11.0 Variances and waivers

The facility did not request a variance or a waiver.

Section 12.0 E-reporting

The permittee is required to electronically submit discharge monitoring reports.

Section 13.0 Public participation procedures

13.1 Information requests

The application has been assigned the following numbers by the Department of Energy and Environmental Protection. Please use these numbers when corresponding with this office regarding this application.

Application No. 202306082 Permit No. UI0000524

Interested persons may obtain copies of the application from:
Whyndam Abrams
Yale University, Environmental Health and Safety
135 College Street, Suite 100
New Haven, CT 06510
Telephone number 203-432-2093
E-mail: Whyndam.abrams@yale.edu

The application is available for inspection by contacting Antoanela Daha at 860-424-3876 or antoanela.daha@ct.gov, at the Department of Energy and Environmental Protection, Bureau of Materials Management and Compliance Assurance, 79 Elm Street, Hartford, CT 06106-5127 from 8:30 to 4:30, Monday through Friday.

Any interested person may request in writing that his or her name be put on a mailing list to receive notice of intent to issue any permit to discharge to the surface waters of the state. Such request may be for the entire state or any geographic area of the state and shall clearly state in writing the name and mailing address of the interested person and the area for which notices are requested.

13.2 Public comment

Prior to making a final decision to approve or deny any application, the Commissioner shall consider written comments on the application from interested persons that are received within thirty (30) days of this public notice. Written comments should be directed to Antoanela Daha, Bureau of Materials

Management and Compliance Assurance, Department of Energy and Environmental Protection, 79 Elm Street, Hartford, CT 061065127 or DEEP.UICPermitting@ct.gov-. The Commissioner may hold a public hearing prior to approving or denying an application if in the Commissioner's discretion the public interest will be best served thereby and shall hold a hearing upon receipt of a petition signed by at least twenty-five persons. Notice of any public hearing shall be published at least thirty (30) days prior to the hearing.

13.3 Petitions for hearing

Petitions shall be submitted within thirty (30) days from the date of publication of this public notice and should include the application number noted above and also identify a contact person to receive notifications. Petitions may also identify a person who is authorized to engage in discussions regarding the application and, if resolution is reached, withdraw the petition. Upon receipt of a petition, the Commissioner shall take action as required by relevant laws, including Public Act 25-84, which was effective upon passage in June 2025. The Office of Adjudications will accept electronically-filed petitions for hearing in addition to those submitted by mail or hand-delivered. Petitions with required signatures may be sent to deep.adjudications@ct.gov; those mailed or delivered should go to the DEEP Office of Adjudications, 79 Elm Street, Hartford, CT 06106. If the signed original petition is only in an electronic format, the petition must be submitted with a statement signed by the petitioner that the petition exists only in that form. Original petitions that were filed electronically must also be mailed or delivered to the Office of Adjudications within thirty (30) days of electronic submittal. Additional information can be found at www.ct.gov/deep/adjudications.

Attachment A– Application with all required Attachments