



Needham Board of Health



AGENDA

Friday July 14, 2023
9:00 a.m. to 11:00 a.m.
Zoom Only

To listen/view this meeting, download the "Zoom Cloud Meeting" app in any app store or at www.zoom.us. At the above date and time, click on "Join a Meeting" and enter the meeting ID **836 3262 9494** and passcode **253929** or click the link below to register:
<https://us02web.zoom.us/j/83632629494?pwd=b3dMZEc1bi9QMlFpQTlPOFdxOE1LZz09>

- 9:00 – Welcome & Public Comment Period
- 9:05 – Review of Minutes (June 9, 2023)
- 9:05 – Senior Assessment
- 9:35 – Staff Reports & Brief Updates
- 10:15 - Other Items
 - Synthetic Turf Field Testing Report
 - 1688 Central Ave
- 10:30 – Public Health Five Year Strategic Plan
- Upcoming BOH meetings
 - Friday September 8, 2023 from 9:00 to 11:00 a.m.
 - Friday October 13, 2023 from 9:00 to 11:00 a.m.
- Adjournment

(Please note that all times are approximate)



Needham Public Health Division



Board of Health Meeting Minutes DRAFT

Date: June 9, 2023

Location: Rosemary Public Services Administration Building – Charles River Room 500
Dedham Avenue, Needham MA 02492 & via Zoom

Members: Kathleen Ward Brown, ScD, Vice-Chair; Edward Cosgrove, PhD, Member; Robert A. Partridge, MD, MPH, Member

Staff Present: Timothy Muir McDonald, Director of Health, and Human Services; Sai Palani; Diana Acosta; Taleb Abdelrahim; Ginnie Chacon-Lopez; Lydia Cunningham; Cindi Melanson

Welcome & Public Comment Period

Dr. Brown called the meeting to order at 9:00AM and initiated a roll call. Present were Dr. Brown – Y, Dr. Partridge – Y, Dr. Cosgrove - Y

According to Chapter 107 of the Acts of 2022, as an act relative to extending certain states of emergency accommodations, as passed by the General Court, and signed into law by Acting Governor Karyn Polito, on July 16, 2022, revised Section 20 of Chapter 20, the Acts of 2021. In so doing, provided modifications to the Massachusetts Open Meeting Law, which allow for flexibility to hold remote only, and hybrid meetings, while preserving public access and, where appropriate, public participation. Currently, that additional flexibility will expire on March 31, 2025, unless additional legislative action occurs. As part of today's hybrid meeting, all votes will occur via a roll call.

There was no request for public comment at this time.

Review of Minutes – (May 12, 2023)

Upon motion duly made by Dr. Cosgrove, and seconded by Dr. Partridge, it was voted to approve the minutes of May 12, 2023, as submitted. Motion passed: Dr. Brown – Y, Dr. Partridge – Y, and Dr. Cosgrove – Y.

Board of Health Fee Schedule **Vote Required**



Needham Public Health Division



Mr. Palani explained that fee information was gathered from other towns. There are multiple ways to create the fee schedule. Natick and Wellesley do charge more than Needham is proposing, while the other towns are closer in line with the proposal.

Dr. Partridge asked about the proposed fee for the marijuana treatment center. Mr. McDonald stated that he believes this is an annual fee. He suggested adding a category for an initial permit versus an annual renew.

Dr. Brown stated that Needham seems to have a more complicated fee schedule than other towns.

The Board discussed approving the proposed fees with an adjustment that the marijuana treatment center annual permit would be \$1,250, and an initial permit of \$2,500. The Board also discussed a change to the proposed tanning permit fees.

Mr. McDonald suggested performing a cost review for all permits from the last fiscal year, to hopefully continue this discussion at a future time. This could include an analysis as to how much staff time is being spent toward restaurant permitting.

Upon motion duly made by Dr. Partridge, and seconded by Dr. Cosgrove, it was voted to approve the revised fee schedule structure with the modifications discussed at this meeting, to include a cost review study in July. Motion passed: Dr. Brown – Y, Dr. Partridge – Y, and Dr. Cosgrove – Y.

Shared Services Memorandum of Understanding *Vote Required*

Ms. Diana Acosta explained that the Charles River Public Health District created a working group with Regina Villa Associates, which consisted of one Board of Health Chair from each community and at least one staff member from each community. The major goal of the group was to create a Memorandum of Understanding (MOU). With the assistance of Regina Villa Associates, a draft MOU for the shared services agreement was created. The initial draft language was reviewed by Needham's Town Counsel. The MOU establishes an agreement for all participating municipalities to commit to working together. This is the first step in creating a solid agreement between all four municipalities in the Charles River Public Health District. The plan is to now create a Regional Advisory Committee that will meet at least once a quarter to discuss matters relating to policy making, budgeting, and the effectiveness of the shared services arrangement.

Ms. Acosta stated that the MOU must be signed by each municipality's Town Manager or Administrator and each Board of Health Chair. The Board of Health first needs to agree to the MOU. No feedback was received on the draft document from the other towns.



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Upon motion duly made by Dr. Partridge, and seconded by Dr. Cosgrove, it was voted to approve and sign the MOU with the Charles River Public Health District Working Group to serve as the framework for an intermunicipal agreement as required by the program. Motion passed: Dr. Brown – Y, Dr. Partridge – Y, and Dr. Cosgrove – Y.

Upon motion duly made by Dr. Partridge, and seconded by Dr. Cosgrove, it was voted to appoint Dr. Cosgrove as the primary representative and Dr. Brown the alternative representative for the working group. Motion passed: Dr. Brown – Y, Dr. Partridge – Y, and Dr. Cosgrove – Y.

Select Board FY2024 and FY2025 Goals

The Board discussed potential additional goals it would like to see for the Select Board, including food security and nutrition for seniors and residents of all ages, ways to address senior isolation, potentially expanded service hours for a number of Town departments, mental health for all ages, Last Mile transportation, and walkability, bike-ability, and physical configuration of the community. Mr. McDonald stated that he would put these into goal considerations to present to the Select Board.

Center at the Heights Space Study & Kitchen Plans

Mr. McDonald explained that he previously presented this concept to the Council on Aging and the Permanent Building Committee. There are three large capital projects on the Town's list that will take the vast majority the capital spending for the next decade or so (replacements for the Mitchell and High Rock Schools, and the renovation/replacement of the Pollard Middle School).

The Center at the Heights final report identified a series of small projects that could be independently pursued if small (mid-six figures or low seven figures) amounts of funding ever become available. Mr. McDonald would like to see a kitchen included as part of this project to help address food security and nutrition issues amongst Needham's senior population. There are also accessibility issues at the Senior Center which need to be resolved. The Town is planning to rent 13 additional parking spaces from the MBTA, restripe the back parking lot, add more handicap spaces, and, if funding can be found, create an additional accessible entrance to the Senior Center. The Board can continue to advocate for cost-related items for seniors and money to renovate the kitchen.

Dr. Brown asked if any of the proposed items preclude other items. Mr. McDonald stated that the projects were intentionally designed to be independent of one another. He did note that there are some projects which may make sense to complete at the same time, if possible. Many senior centers now contain cafés or lounges. This is ideal but may not be possible. Most of the requests



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are for reconfiguration of the existing space to meet the needs more accurately and potentially expanding the space into the basement.

Staff Reports

Public Health Nursing

Ginnie Chacon-Lopez explained that blood pressure clinics at Needham Housing Authority continue with variable interest from residents. Both Matter of Balance classes ended, and a total of 13 people 'graduated'. Four CPR classes were offered to the public, and all were well attended. COVID vaccines have been offered by individual appointments in the office. 40 gift bags were created and distributed for Mother's Day by the Domestic Violence Action Committee. In May, notable cases included less than five cases of Strep A which were confirmed through lab testing at a local LTC/SNF. A number of COVID cases were also confirmed at a local school affecting teachers and students. The majority of the cases were in the same classroom and other students were also out with symptoms.

Epidemiology

It was noted that there were 22 confirmed cases of COVID-19 in May. There was no additional update at this time.

Emergency Management

There was no update, beyond the written report included in the Board's meeting packet, at this time as Michael Lethin was out at a National Guard training.

Emergency Preparedness

Mr. Abdelrahim explained that the team coordinated with the Needham Police Department to provide Active Threat and Situational Awareness training to volunteers and staff members. The team also nominated one volunteer from the Needham unit to attend a special statewide Medical Reserve Corps Training Day. On May 15th, staff participated in a hazard vulnerability assessment survey of Region 4AB health and medical stakeholders, including public health and emergency medical services. Mr. Abdelrahim attended the Active Shooter Tabletop Exercise at Babson College. Staff continues to work on accreditation.

Shared Services Grants

Ms. Acosta reported that Roland Abuntori continues to assist Needham with various inspections. The team is considering expanding the use of FoodCode-Pro and adding on similar programs such as HousingCode-Pro and PoolCode-Pro. She noted that the budget increased from \$150,000 to over \$280,000 for next year.



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Accreditation Team

Ms. Melanson explained that the Senior Assessment will be detailed at the next Board meeting. The data has been used in the Community Health Assessment. She explained that there are two projects ongoing for quality improvement such as a Food Safety Excellence Program and Alcohol Compliance checks. Also ongoing are workforce development, readiness assessment, identifying and writing supportive documentation, the Community Health Assessment, and performance management.

Environmental Health

Sai Palani stated that an enactment date was set for the Food Safety Excellence Program for November 1, 2023. A pilot will begin with food establishments following the annual fall forum food safety trainings.

Regarding the ongoing housing case involving conflict between an occupant and landlord, a final joint inspection was conducted by Public Health and Building departments on May 11th. Staff met with the occupant and the landlord on site, with a police escort. All remaining housing order letter items, with the exception of the window and screen replacements in one unit, were found to be completed. A final letter to the landlord with a summary of the items that were completed, and was sent via certified mail, mailed, and emailed to all parties involved, including the landlords' attorney.

Regarding the Rice Barn, Mr. Palani performed a plan review, met with Mr. Intha, and went over application and proposal to open issue by issue. Mr. Palani performed a walk-thru of the establishment and noted the lack of a mop sink. Mr. Intha will need to resubmit his application and address outstanding building department concerns prior to moving forward.

Mr. Palani reported that there will be another variance sought for a business proposing to bring food in from off site, similar to a catering business.

There are currently ten vendors proposed for the Farmers Market.

Dr. Brown asked about the Synthetic Turf Policy. She asked how often and how the turf will be tested. She asked about temperature regulations, in order to ensure safety for people using the fields.

Substance Use Prevention - MassCALL3 grant

Ms. Cunningham reported that MassCALL3 will be funded \$250,000/year for FY24 and FY25. Staff held the first of two MassCALL3 strategic planning meetings. The final meeting will be held this month. The group continues to work on an action plan and on the social media and movie theater campaign. This program went live last month and continues to do well. There will be data to review once the campaign is complete.



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Substance Use Prevention

SPAN partnered with Needham High School to host a Social Host and Hidden in Plain Sight event, held on May 2nd. Fifty-five people attended. The first session for SPAN strategic planning was held on May 31st via Zoom and was facilitated by Amanda Decker of Bright Solutions. Eighteen people attended, including twelve coalition members and six prevention staff. Sessions will continue over the summer. A TIPS training, led by Carol Read and Officer Jason Sullivan, was held on May 15th. There were 25 in attendance, including nine from Needham businesses and one from a Dedham business.

Traveling Meals

Mr. McDonald explained that an agreement will soon be signed between the Town and the Hospital, allowing this program to continue for at least another two-year period.

Brief Updates

- Alcohol Compliance

There were some amendments made to the Needham alcohol regulations, which were detailed in a chart sent to the Board of Health.

- Senior Assessment

Mr. McDonald explained that this item is informational only. A detailed presentation will be made to the Board next month.

- Public Health Five Year Strategic Plan

Mr. McDonald stated that the strategic plan work will begin in July. It will include setting goals and helping to ensure that those goals integrate into a departmental strategic plan. This will also be carried down into the staff's goals and objectives as part of the review process.

- Housing Updates

Mr. McDonald explained that a housing situation previously thought to be resolved is continuing for now, but staff are working to do what is appropriate. He explained that he would like to use data to assess some of the most frequently occurring violations and then do some education for licensees or permit holders.

Mr. Palani noted that the Housing Code changed approximately two weeks ago.

- Substance Use Prevention

Mr. McDonald noted that the Board was supplied with a chart that detailed the compliance checks and TIPS trainings, which shows that there is not necessarily a strong correlation the two. It was noted that Dr. Epstein had previously had a question as to whether or not this data changed when Needham became a non-dry town (that is, allowed liquor sales from package



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stores rather than just liquor consumption at food service establishments). The data continued to trend down until 2018 and now is on an upward trend for Needham. Dr. Epstein also had previously asked about how this compares to other communities. Mr. McDonald said that it would be difficult to make that comparison as there is not ready access to that data.

In general, most categories of substance misuse averaged across the entire MetroWest region continue to trend down, while in Needham some categories of substance misuse are trending up, including drinking for the past 30 days and binge drinking for the past 30 days.

Upcoming BOH Meetings

- **July 14th from 9:00 – 11:00 a.m. at likely remote only via Zoom.**

Adjournment

Upon motion duly made by Dr. Cosgrove, and seconded by Dr. Partridge, it was voted to adjourn the meeting Motion passed: Dr. Brown – Y, Dr. Partridge – Y, and Dr. Cosgrove – Y.

The meeting was adjourned at 10:50AM.

Attachment:

June 9, 2023 meeting packet



**Board of Health
TOWN OF NEEDHAM
AGENDA FACT SHEET**



MEETING DATE: July 14, 2023

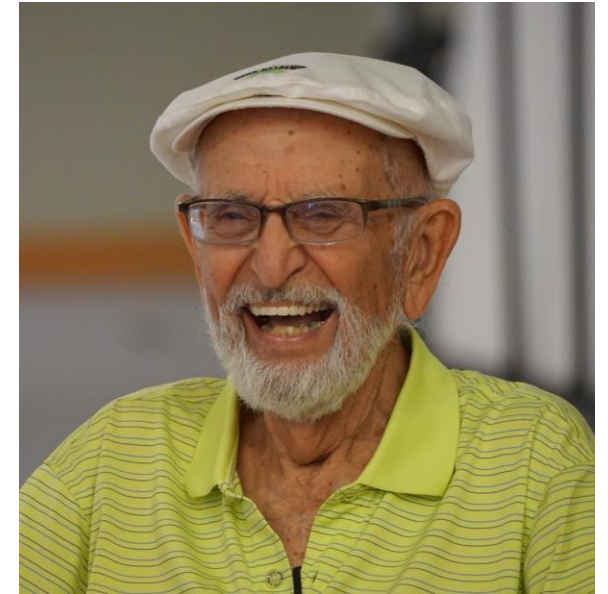
Agenda Item	Needham Health Aging Assessment
Presenter(s)	Lynn Schoeff Cindi Melanson

1.	BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED
	2023 Needham Healthy Aging Assessment
2.	VOTE REQUIRED BY BOARD OF HEALTH
	No vote required.
3.	BACK UP INFORMATION:
	a. Needham Healthy Aging Assessment Final

Needham Healthy Aging Assessment



Spring 2023





Background

- Purpose: to gather information on factors supporting and impacting seniors living in Needham
- Summer 2022
- Residents 60 years of age and older
- Data collection
 - Survey (738 responses; est. 9.4% participation rate)
 - Focus groups (4)
 - Needham Commission on Disabilities, residents in Needham Housing Authority developments, and Center at the Heights participants
 - Key informant interviews (23)
 - Town officials, staff from town departments and non-profit organizations, residents

Demographics of Respondents

Estimated Sample Size and Response Rate

	ACS 2020 Population Estimate	Needham Survey on Healthy Aging	Estimated Percentage
60-64 years	1,816	104	5.7%
65-74 years	3,170	320	10.1%
75-84 years	1,579	246	15.6%
85 years and over	1,319	68	5.2%
Total	7,884	738	9.4%

Demographics of Respondents

Gender Identity (n=738)

	Number	Percentage
Female	502	68.0%
Male	227	30.8%
Transgender Female	1	0.1%
Transgender Male	2	0.3%
Non-binary or gender non-conforming	1	0.1%
Some other way	0	0.0%
Prefer not to answer	5	0.7%

Demographics of Respondents

Years of Age (n=738)

	Number	Percentage
60-65 years	137	18.6%
66-70 years	149	20.2%
71-75 years	177	24.0%
76-80 years	145	19.6%
81-85 years	72	9.8%
86-90 years	43	5.8%
91-95 years	8	1.1%
96-100 years	7	.9%

Demographics of Respondents

Racial/Ethnic Identity (n=738)

	Number	Percentage ^(a)
Black or African American	2	0.3%
Asian	21	2.8%
Hispanic or Latino(a)	2	0.3%
Native American or Alaska Native	3	0.4%
White	678	91.9%
Native Hawaiian or Pacific Islander	0	0.0%
Some other way	18	2.4%
Prefer not to answer	19	2.6%

Demographics of Respondents

Residence Setting (n=729)

	Number	Percentage
Private residence	670	91.9%
Affordable housing (Chapter 40B)	14	1.9%
Needham Housing Authority Property	26	3.6%
Senior housing	17	2.3%
Long-term care facility	2	0.3%
Missing	9	-

Demographics of Respondents

Type of Residence (n=733)

	Number	Percentage
Single family home	579	79.0%
Town home or duplex	21	2.9%
Apartment	99	13.5%
Condominium	32	4.4%
Accessory dwelling unit (attached apartment)	2	0.3%
Missing	5	-



Highlights: *Strengths*

- Services
 - Library
 - Center at the Heights
 - Community Council
 - Public Health Division
 - Transportation services
 - Meal delivery (Aging Services) and Traveling Meals
 - Virtual programming
- Collaboration and commitment
 - Town staff, community organizations, and volunteers work together
- Positives from Pandemic
 - Increase use of technology and engagement with online programming



Highlights: *Challenges*

- Housing (limited options, cost, taxes, inaccessible)
- Cost of living (real estate taxes, food, trash)
- Food security (cost, access)
- Feeling devalued (pushed out by rich, large, expensive housing)
- Transportation and driving (limited options, cost, accessibility, parking)
- Decreased access to health care (transportation, appointment availability)



Highlights: *Challenges* (cont.)

- Connections and isolation (25% not very or not at all connected)
- Communication technology (increased use but still challenging)
- Programs geared toward "older" seniors (need more for "younger" seniors)
- Pedestrian accommodations (more benches)

Cost of Living

Worry About Cost of Living (n=688)

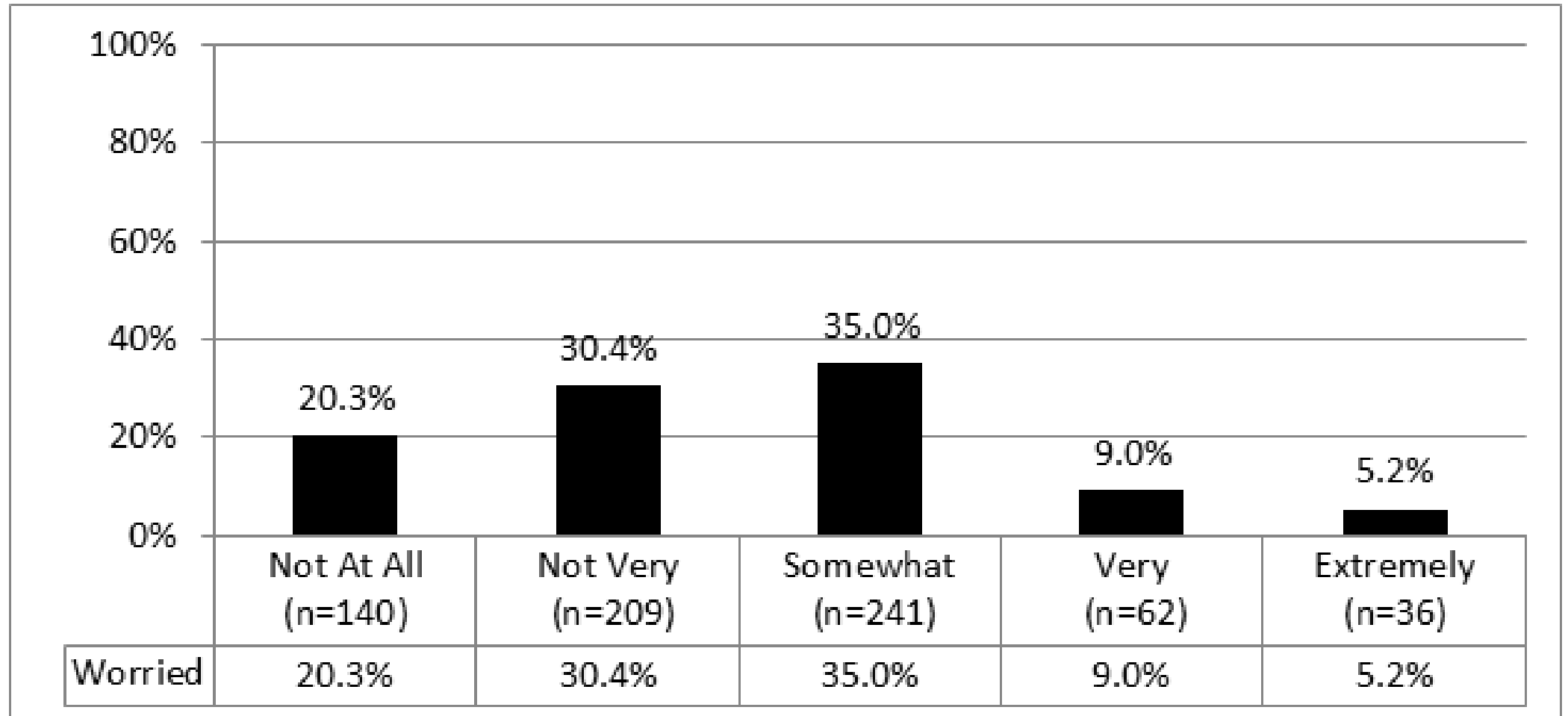


Figure Notes: A total of 688 individuals answered this question (50 missing). Mean = 2.48 out of 5.00.

Food Security

Food Access, Food Preparation, Food Security (n=686)

Food Access	Number	Percentage
You had difficulty finding the kind of food that you wanted	84	12.2%
You had difficulty getting transportation to the grocery store	37	5.4%
You had difficulty having groceries delivered	34	5.0%
Food Preparation	Number	Percentage
You were not able to prepare or cook food because of health problems	52	7.6%
Food Security	Number	Percentage
You felt that you couldn't afford to eat balanced meals	31	4.5%
You worried that your food would run out before you could get more	26	3.8%

Health Care Access

Difficulty Accessing Health Care in Past 6 Months (n=666)

	Number	Percentage
Did not need health care	58	8.7%
No difficulty accessing health care	478	71.8%
Had trouble accessing health care	130	19.5%
Missing	72	-

Transportation

Transportation Needs (n=645)

	Never	Rarely	Sometimes	Very Often	Mean ¹⁻⁴
Medical appointments	48.7%	9.0%	26.7%	15.7%	2.09
Visiting friends or relatives	56.6%	6.0%	22.6%	14.7%	1.96
Shopping	58.0%	6.2%	19.2%	16.6%	1.94
Non-medical appointments	57.4%	11.6%	21.4%	9.6%	1.83
Work	82.6%	3.9%	5.4%	8.1%	1.39

There were 93 missing responses.

Isolation and Loneliness

Feel Isolated or Lonely (n=693)

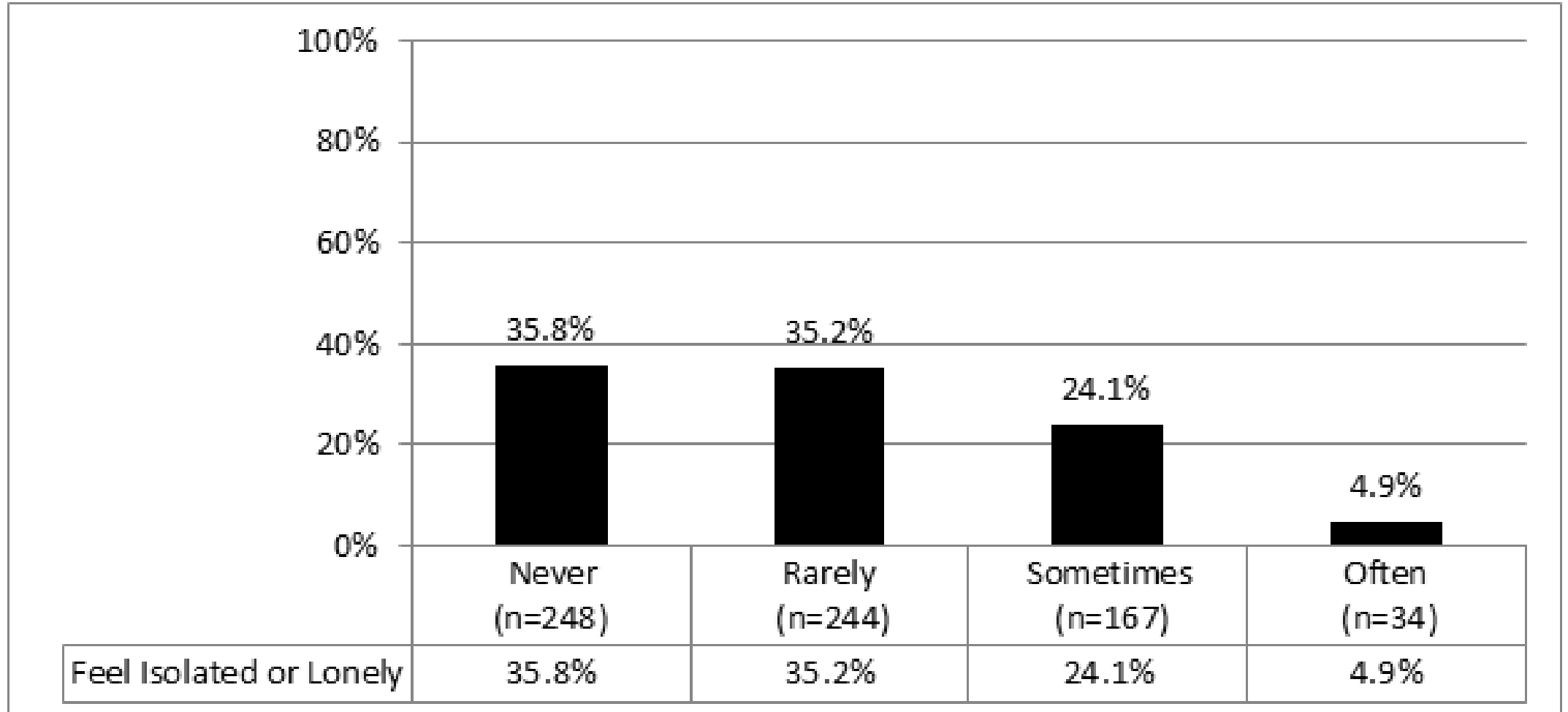


Figure Notes: A total of 693 individuals answered this question (45 missing). Mean = 1.98 out of 4.00.

Isolation and Loneliness

Interaction with Other Individuals Versus Before Pandemic (n=693)

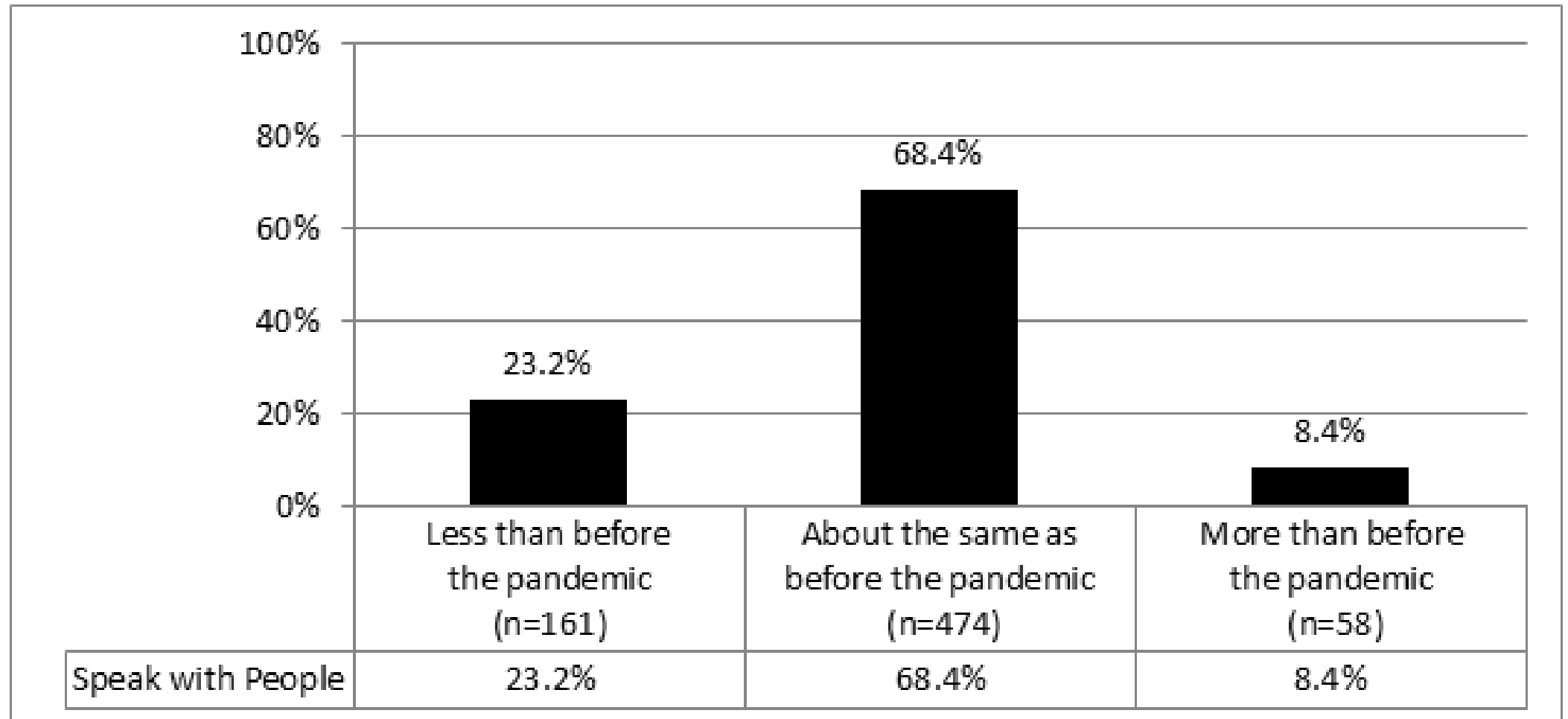


Figure Notes: A total of 693 individuals answered this question (45 missing).

Isolation and Loneliness

Feel Isolated or Lonely in Comparison to Before COVID-19 Pandemic (n=693)

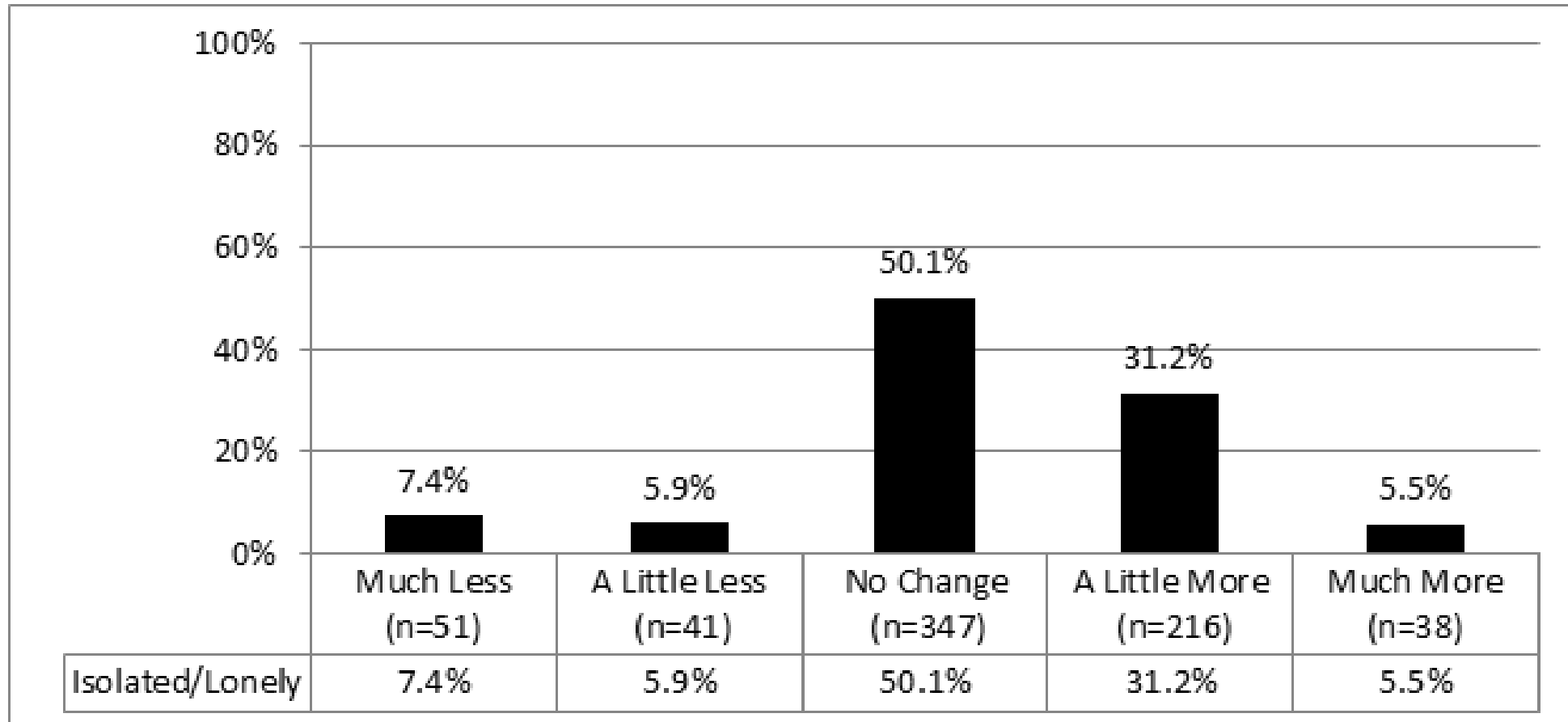


Figure Notes: A total of 693 individuals answered this question (45 missing). Mean = 3.22 out of 5.00.



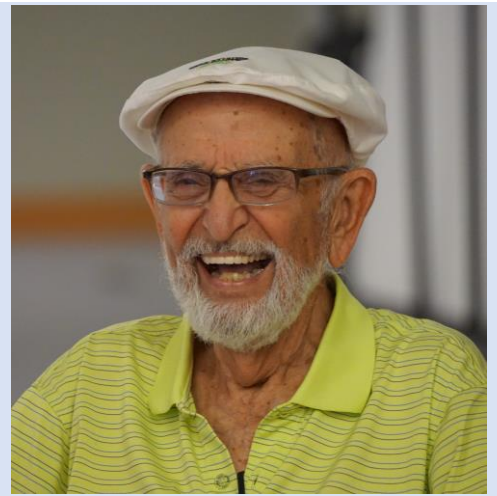
Limitations

- Diversity and representation
 - Assessment did not specifically examine diversity, equity and inclusion concerns
 - Potential language barriers to participation
 - Under-represented groups (Black, Hispanic and Asian)
- Time and staff constraints



Next Steps

- Findings incorporated into Needham's overall Community Health Assessment (in process)
- Identify approaches to address concerns, examples may include:
 - Increase awareness about tax relief and transportation programs
 - Encourage older adults to conduct or request safety audits of their homes
 - Identify sites for additional benches in the community
 - Seek input from younger seniors to learn what additional programming would meet their needs
 - Employ creative outreach to identify and reach out to isolated seniors
- Issues to Pursue Further
 - Isolation and loneliness, caregiver support, health care access



NEEDHAM HEALTHY AGING ASSESSMENT

May 2023



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Acknowledgements

The Needham Public Health Division would like to acknowledge organizations and individuals who supported this effort and provided guidance and insights on all aspects of this assessment, including survey and focus group participants along with key informants who shared their perspectives about aging in Needham.

Leadership	
Kate Fitzpatrick, MBA, Town Manager, Needham, MA Timothy Muir McDonald, MPA, Director, Department of Health and Human Services	<i>Needham Board of Health Members</i> • Kathleen Ward Brown, Sc.D. • Edward Cosgrove, Ph.D. • Stephen Epstein, M.D. • Tejal Gandhi, M.D., MPH • Robert Partridge, M.D., MPH
Advisory Committee	
<i>Needham Aging Services Division</i> • Aicha Kelley, Assistant Director of Programming and Transportation, • Jessica Moss, LICSW, Assistant Director of Counseling and Volunteers • LaTanya Steele, MPA, Director <i>Community Partners</i> • Sandra Robinson, Executive Director, Needham Community Council • Alyssa Kence, MBA, Director of Community and Strategic Initiatives, Beth Israel Deaconess Hospital-Needham	<i>Needham Public Health Division</i> • Jessica Kent, Senior Public Health Associate, Needham Public Health Division • Julie McCarthy, MS, Epidemiologist • Cindi Melanson, MPH, Senior Public Health Associate • Lynn Schoeff, MEd, Senior Public Health Specialist <i>Survey Administrator and Analyst</i> • Scott Formica, Senior Research Scientist, Social Science Research and Evaluation
Assessment Participants	
Focus group participants (Needham residents and staff) Key informants (Town officials, organizational leaders, residents; see Appendix D) Survey respondents (residents)	

Executive Summary

During summer 2022, the Needham Public Health Division, in collaboration with the Needham Aging Services Division, conducted a Healthy Aging in Needham Assessment focused on residents ages 60 and older. The purpose of this assessment was to gather information on factors supporting and impacting seniors living in Needham. Focus groups and key informant interviews with residents, and town and organizational leaders supplemented anonymous survey data to provide insights into challenges faced by seniors as they age in the community. The data also highlight community assets that make Needham a desirable place to live.

The average age of the 738 survey respondents was 73 years (range: 60 years to 99 years). Most respondents (92%) felt that their health was good, very good, or excellent in comparison to their peers. Many enjoy programs available to them through the Aging Services Division and the Needham Community Council and have long-term connections in the community. In general, respondents were laudatory of existing community services for seniors, provided recommendations for community services they would like to see added, expressed desire for more transportation options for seniors (including free or reduced cost options), are concerned about housing availability and affordability (particularly for those wishing to downsize or stay in place as they age), advocated for tax exemptions for seniors (including property taxes), and made recommendations for senior-friendly community infrastructure modifications.

Most of the dominant worries and recommendations were also present in a similar assessment in 2016. This most recent assessment also highlights additional challenges faced by seniors including some degree of difficulty with different aspects of food security; decreased access to health care due to the COVID-19 pandemic; provider availability and long wait times for appointments. Use of technology was high among survey respondents; however, it is important to note that 24% of those who completed the survey on paper, rather than online, reported that they never go online, suggesting that the survey may over-estimate internet use among residents 60 years and older in Needham.

Although social connections generally are strong, the pandemic has had an impact. Over a quarter of survey respondents reported feeling less connected to the community, since the outset of the COVID-19 pandemic, and over a third (37%) reported feeling more isolated or lonely since the outset of the pandemic. A smaller group of respondents reported feeling isolated or lonely often. Although participation in in-person or online social activities was high among respondents, a subset of respondents (10%) indicated feeling unable to participate in certain activities because they are only offered online. Not knowing how to use the technology was the most common reason.

The most seemingly intractable challenge faced by older residents is how to continue living in Needham with housing as limited and expensive as it is. While other bodies have been wrestling with this complex dilemma as it affects all Needham residents and prospective buyers, the responses gathered through this assessment should be considered going forward. At the same time, policy and program developers can review this assessment and find ways to address other concerns raised by older adults.

Background

In August 2016, the Needham Public Health Department and the Aging Services Division published the [*Assessment of Housing and Transit Options for Needham Seniors*](#), which was based on information collected with a survey, focus groups, and interviews. The focus of the 2016 project was selected after staff members had heard many older adults express concerns about the lack of options for housing and transportation.

Survey and focus group participants in 2016 were consistent in their eagerness to continue living in Needham, and they identified many community elements that make Needham desirable, including the commuter rail and the MBTA bus as assets allowing connections to Boston. Participants in 2016 also described a range of senior living communities and condominiums that allow older adults to live in Needham.

On the other hand, the dominant worries expressed during the 2016 assessment were about not being able to stay in Needham as they age due to unaffordable and limited small housing stock; difficulty making their homes “age-friendly”; lack of local transportation options for those without cars or who no longer drive; and pedestrian safety.

Some of the concerns have been partially addressed since 2016 through policy and program changes.

- Accessory dwelling units (ADUs) were permitted by Town Meeting through passage of a by-law on October 28, 2019. The conditions under which the by-law allows ADUs are: one unit must be owner occupied (either the main dwelling or the ADU); the second unit must be occupied by family of the owner or by a caregiver of owner; the ADU must be attached to, or part of, the primary dwelling; it must be subordinate in size to the main dwelling, and no more than 850 square feet. In 2021, a group of Needham residents submitted a proposal to loosen some of those restrictions. And most recently, on May 3, 2023, Town Meeting members approved a new Planning Board proposal to expand the size to 900 square feet, allow ADUs to be rented, expand the allowable occupants, and allow rentals as short as 6 months.
- The Aging Services Division expanded its transportation service with the addition of a new vehicle and a grant-funded, time-limited partnership with JFK Taxi to provide meal delivery and rides to medical appointments (December 2020 through March 2021).

Because it had been six years since the *Assessment of Housing and Transit Options for Needham Seniors*, the Needham Public Health Division, in collaboration with the Needham Aging Services Division, implemented a new assessment to examine current issues faced by older adults in Needham.

Anecdotal evidence has continued to indicate that housing and transportation remain as barriers to older residents aging in place. Beyond those issues, staff who work with older adults have been concerned about elders’ well-being. While isolation and depression have always affected older adults, staff have been more concerned that social, emotional, and mental health issues may have intensified during the COVID-19 pandemic. Thus, the 2022 assessment included those issues along with use of technology, food security, cost of living, access to health care, as well as transportation and housing.

Methods

An advisory committee oversaw the Senior Assessment and included leaders from the Aging Services Division (Director LaTanya Steele and Assistant Directors Aicha Kelley and Jessica Moss), the Needham Community Council (Sandra Robinson, Director), Beth Israel Lahey Hospital (Alyssa Kence, Director of Community and Strategic Initiatives), and staff from the Public Health Division (Julie McCarthy, Epidemiologist; Cindi Melanson and Lynn Schoeff, Senior Public Health Associates). The advisory committee had been concerned that residents, perhaps feeling survey fatigue due to numerous surveys in recent years, would not engage in the assessment. To ensure adequate participation in the survey, organizers conducted extensive outreach.

Survey

The Survey on Healthy Aging in Needham consisted of 69 questions in nine broad domains: demographics; living situation; food and cost of living; health care access; use of technology; social connections; errands and social activities in the community; home modifications to facilitate healthy aging; and transportation methods (see Appendix B). The survey data were collected and analyzed by Scott Formica, PhD, a highly experienced research scientist with a long history in public health, who also wrote the technical report (see Appendix A).

The survey was available in paper and electronic formats.

- There were nine collection points for paper surveys, each with surveys and a collection box: Needham Community Council, Center at the Heights, Needham Free Public Library, the Treasurer and Town Clerk offices at Town Hall, Linden-Chambers housing development, the YMCA, Rosemary Recreation Center, and the Public Services Administration Building.
- The survey was translated into Mandarin and Russian, and copies were provided to the Needham Housing Authority (three surveys in each language were completed).
- Paper surveys were distributed with meal deliveries to home-bound elders by the Public Health Division and Aging Services Division.
- The Needham Community Council gave paper copies to food pantry participants.
- Notices were posted on four Facebook pages and three webpages and in several newsletters.
- Postcards were mailed to every resident aged 60 and older.
- The survey was also a hands-on activity at the Needham Community Council's Tech and Tutors program.

Survey participation was considerably higher in 2022 (738) than in 2016 (650). The participation rate among residents 60 and older is estimated at 9.4% (see Appendix A, Table 1). More people completed the 2022 survey online as compared with the earlier assessment. In 2016, 30% filled out paper surveys while fewer (16%) used the paper option in 2022. The earlier survey had a wider age range and included people who were 55 years and older, while the 2022 age range began at 60. (Note: during the pandemic, electronic notebooks and technical support were provided to many older adults. This may partially account for the increase in online participation in the subsequent survey.)

Focus Groups

Members of the advisory committee facilitated four focus groups with a total of 32 participants. The groups included members of the Needham Commission on Disabilities, residents in Needham Housing

Authority developments, and participants in morning activities at the Center at the Heights. Discussions focused on what makes Needham a good place in which to live and age, and the challenges one encounters as an older person; age-friendly housing; social connections; technology; and access to healthy meals (see Appendix C, Focus Group Guide).

Key Informant Interviews

Twenty-three people were interviewed for the assessment. Those interviewed included Town employees and residents; local and state political representatives; and clergy and community-based service providers (see Appendix D, Interview List and Appendix E, Interview Guide).

Findings

The overarching sentiments of this assessment are that Needham is a desirable place to live as one ages, while many senior residents face barriers as they strive to continue living in the Town. The section below describes notable strengths of the Town and its services, as well as current challenges senior residents face in their daily lives.

Strengths of aging in Needham

Participants in focus groups, surveys, and interviews shared positive feedback about many aspects of Needham that make it a desirable town in which to age.

Services

Focus group participants praised several municipal departments for providing very good services and opportunities for socializing. The Library and the Center at the Heights were identified as such in all the focus groups. A few residents who also participate in senior centers in neighboring communities said that Needham's is the best senior center in the area. The Community Council was lauded for its medical equipment loan program and for its volunteer opportunities. The Public Health Division was praised for its vaccination program. Participants also reported favorably about transportation services provided by Aging Services and the Community Council, including their Lyft program. Focus groups highlighted meal delivery by Aging Services and Traveling Meals (a program of the Public Health Division). Consistent with the focus groups, transportation services provided by Aging Services and Needham Community Council were commended in nearly all the interviews.

Focus group participants also identified some positive surprises from the pandemic. Many folks developed new technology skills and found *increased*, rather than decreased, accessibility to community programs and church services due to the use of Zoom.

Learning to zoom has opened up so many possibilities!!

The Aging Services Division was consistently named for providing high quality programming. Several interviewees praised the addition of virtual programming for reaching more people.

- *Virtual programming is reaching well beyond Needham to other parts of Massachusetts, even other states.*

- *I loved that my church had online and then hybrid services in the beginning. The hybrid services have really expanded access to the church. Old ladies are now connected to church, and people are attending from all over.*

Similarly, survey respondents provided additional comments and praised existing community services for older adults.

- *I am extremely impressed with the services and support that the senior center and the Community Council offer. They ... offer a wealth of support and information... I also commend the senior center for their extraordinary support and services during the pandemic... We are lucky seniors to live in such a supportive and helpful community! A huge thanks to all who help to make this town a wonderful place to live!*
- *I am grateful for the services being offered by the Center at the Heights as well as the Needham Community Council. All sorts of folks work hard to serve the older population ... and they do an excellent job.*
- *The programming offered by the Needham COA Center has been outstanding. Without the Zoom classes I would have been very isolated. I know from numerous friends that the Needham COA programming is the local Gold Standard for Senior programming.*

Collaboration and commitment

Key informants also recognized dedicated and committed Town staff, as well as the collaborations among departments and community organizations that serve elders, as assets in all the interviews. There was a great deal of praise for volunteers, who were described as passionate in their commitment to serve Needham residents.

Challenges to aging in Needham

As in 2016, concerns related to housing were paramount for participants in all data gathering modes. Housing was followed closely by the cost of living in Needham and the lack of transportation options.

Housing

Until recently, Needham's housing stock has consisted largely of modest single-family homes built in the early and mid-twentieth century to accommodate middle-class migration to the suburbs. In recent years, the median price and the nature of housing has changed as described by the Planning and Community Development Department.

The Town of Needham has approximately 11,800 total housing units with a median single-family house price of \$1.29 million in September 2021 (\$885,500 for condominium units), up from \$1,065,000 (+22.1%) and \$805,000 (+10%), respectively, as of the end of 2019. Housing prices are high and rising, up to \$1.45 million and \$850,000 for single-family homes and condos, respectively, as of September 2022. Further evidence of tight market conditions includes vacancy rates for rental and homeownership units of only 2.6% and 1.0% respectively. Few homes in the private housing stock are affordable to low- and moderate-income residents. These conditions are exacerbated by substantial teardown activity

where contractors replace modest older homes with larger very expensive ones, further driving up housing prices and eroding housing options.¹

Participants in focus groups, surveys, and interviews cited the soaring cost of housing, along with limited supply of homes suitable for an aging population, as the greatest challenge older adults face in Needham. They reported that the few senior communities in and around Needham have long wait lists; condominiums are very costly; and modest ranch and cape-style homes are being torn down and replaced by houses that are too big and expensive.

Many people who have lived in Needham for decades feel compelled to stay in homes that are too large and may be unsafe for those with disabilities or who anticipate mobility problems.

- *Many older adults are over-housed, living in larger homes they can't afford to leave.* Interview
- *My husband and I are in a house that is too big for us, but we can't afford to downsize.* Focus group
- *My house is completely inaccessible.* Focus group
- *Needham is unaffordable to those who wish to age in place. Small homes are becoming scarcer. Seniors don't need or want huge, expensive homes.* Survey

Most survey respondents (79%) reported that they currently live in single-family homes, with three-quarters (74%) unable to make home modifications due to cost, the architecture of the home, or other barriers (see Appendix A, Table 22). Half (49%) have modified their homes with safety features such as bathroom changes, better lighting, or improved accessibility into and through their homes.

Only six survey respondents said they had added an accessory dwelling unit to their home. There were several comments citing the bylaw's lack of flexibility as an impediment to doing so.

- *The revised building code for building an in-law suite on to the home was a great step. How about that add on being available to another who is looking for a living situation to rent and possibly find the human contact needed that one might feel and that has no local family.* Survey

Cost of living

In addition to the cost of housing, participants reported financial difficulty due to the high cost of living in Needham, with real estate taxes and food most often identified.

Half of survey respondents reported that they were worried about the cost of living (35% were *somewhat* worried and 14% were *very or extremely* worried). Concern about cost of living is inversely correlated with household income. Twenty-three percent of those with annual income under \$100,000 reported being very or extremely worried about cost of living, and that increases to 39% of respondents with household income under \$50,000 (see Appendix A, Figure 1).

¹ Housing and Zoning Analysis, Town of Needham Planning and Community Development Department, February 2021; Revised January 2022

Many comments in focus groups and on the survey were about property taxes rising beyond affordability for seniors.

- *Taxes and cost of living in Needham will make it difficult to retire and stay in town. Survey*
- *Affordability – the property taxes are so high. High cost of transportation is another problem. Focus group*
- *The continued increase of local taxes and living expenses (heating, food, medical, services, etc.) make it very difficult for seniors (and those on fixed incomes) to live in Needham. Survey*
- *The cost of living in Needham has risen substantially. I cannot afford to make repairs to my home. I wish Needham would re-evaluate and find a way to help seniors be able to live out their lives in the town they grew up in and have fond memories of. It seems we are priced out of town which is sad. Survey*

Survey responses also mentioned the cost of trash collection as a challenge.

- *Provide free services for trash pick-up and disposal (hardship for elderly to take trash to the dump who can't afford to pay someone!). If nothing else, the town should give us free trash bags please! Survey*
- *Other towns have trash collection service. Needham residents are expected to do all their own trash and garbage services...A large number of folks end up paying for private trash pickup services weekly on top of ever increasing property taxes. Survey*

Food security

The high cost of food in Needham was another common theme.

- *I think that the price of groceries in Needham for people living on a fixed income is ridiculous. Need more options. Survey*

Participants spoke of very limited transportation options to get to lower-priced grocery stores outside Needham such as Market Basket in Waltham and Stop and Shop in Newton.

Among survey respondents, 16% reported some degree of difficulty with access to food, including difficulty finding the kind of food they wanted, getting transportation to grocery stores, or getting groceries delivered (see Appendix 1, Table 11). Six percent reported that they couldn't afford to eat balanced meals or that they were worried about food running out. A focus group member reported that they “rely on meals from the senior center for better balanced meals.”

Feeling devalued

Focus group and survey participants reported feeling that Needham has become unwelcoming of older adults. They said that policies, both explicit and by default, are forcing seniors out of the town. Increasing property taxes and lack of affordable homes were most identified.

- *Needham lacks affordable housing options for those who would like to downsize. Anxious to promote two-million-dollar McMansions and desirous of only a very high-income population*

with deep pockets to pay town taxes. It creates a rich monoculture, lacking the richness of diversity and humanity. Needham ends up with very unfriendly policies for seniors and gives a sense that seniors are not valued, should just move out, not wanted. Survey

- *We, older people, have been a big part of this town and now we are being phased out. Start taking care of the older people on fixed incomes. Survey*
- *Elderly people move out of town against their wills [sic] because they can't get their needs answered here. But their lives and friends are here. Survey (excerpt from comment about need for more retail shops).*
- *One survey respondent expressed the feeling that Needham has "very unfriendly policies re Seniors and gives a sense that Seniors are not valued, should just move out of Needham, not wanted."*

Transportation and driving

Lack of local transportation continues to be a problem for older adults in Needham. While this was frequently mentioned by many respondents, it had greater implications for people who live in remote areas within Needham, such as Seabeds Way and Charles River Street. The Seabeds Needham Housing Authority development is in the northeast corner of town, where access to services is impeded by geography (nearly two miles from Needham Center) as well as by a long hill the residents must climb to get to the only public bus. As in the 2016 assessment, several participants spoke of the need for a local bus (a circulator) or a shuttle from Needham Heights to Needham Junction.

Since 2016, ride-sharing services (Lyft and Uber) have become better used by the older population and were cited as a transportation option. However, some focus group and survey participants said that the cost of these services is a barrier.

- *I am disabled. Often I don't go anywhere because all I can afford is a \$2 fee for the van provided by the Senior Center. Survey*

Insufficient transportation to supermarkets within and outside Needham was a common problem identified in focus groups and in the survey, with 5.4% of respondents (37 individuals) reporting difficulty getting transportation to grocery stores.

Another theme was difficulty getting to medical appointments outside of Needham, with concerns about driving to Boston or about lack of transportation services.

- *I must take my husband to Boston for his medical appointments. Driving into the city and parking is extremely difficult and stressful for me and taxis or Uber is so expensive and technologically challenging. A town sponsored taxi like we had a few years ago would be so appreciated. Survey*
- *Wish I had transportation to doctor appointments outside Needham into Boston. Survey*

In focus groups and surveys, participants expressed concerns about driving in Needham. Some identified aggressive drivers. Others expressed concerns in anticipation of the time when they can no longer drive.

In the survey and in focus groups, residents identified parking in Needham as a challenge. One survey respondent noted the number and location of parking spots as a barrier. A focus group participant zeroed in on accessible parking spots – both their lack and the abuse of them – as a problem.

There appeared to be some confusion about what transportation programs are available.

Connections and isolation

Isolation and depression have always been concerns in the older adult population, however the losses and limitations associated with the pandemic have exacerbated these issues. Staff have been worried that social, emotional, and mental health issues may have intensified during the COVID-19 pandemic. For this reason, questions about isolation and personal connections were included in the survey.

While three-quarters of survey respondents reported feeling connected or very connected to the community, almost a quarter (24%) said they were *not very* or *not at all* connected (see Appendix A, Figure 2). Over a quarter (29%) reported feeling *less connected* to the community, than before the pandemic.

Most respondents (71%) reported *never* or *rarely* feeling isolated or lonely, 24% felt isolated or lonely *sometimes*, and 5% felt isolated or lonely *often*. It should be noted that this means that 167 people felt isolated or lonely *sometimes*, and 34 individuals reported feeling isolated or lonely *often*. People living alone were more likely than those who lived with others to report feeling isolated or lonely. Over a third (37%) reported feeling *more isolated or lonely* since the outset of the pandemic.

- *Fear of infection kept us very isolated. Even within the household once the children went back to school. Focus group*
- *My husband is immunosuppressed, so we had to isolate completely. Focus group*
- *There was judgement and stigma for people who chose to be very cautious. Focus group*
- *In the early days, people made an effort to stay in touch. But that changed after a while and now they are not making the extra effort. Focus group*
- *During COVID, “Connections disappeared. Unable to access community rooms. Senior center closed.” Focus group*
- *Social connections changed, “drastically because I am hearing impaired. Masks impaired lip reading.” Focus group*
- *The lonely elderly need help when they live along (sic), can’t get out, can’t get to the Senior Center. Some are very lonely, lacking human interaction, medical attention, not eating (or shopping) adequately and are depressed. Survey*

Almost all respondents reported at least weekly contact with other individuals in person (94%) or by phone (93%), however, about one quarter (23%) reported speaking with people less frequently than before the pandemic.

Communication technology

Although communication technology use was more prevalent among older adults in 2022 than it was in 2016, and although some focus group participants said that they had developed new technology skills during the pandemic, other people still have trouble using technology or do not find it useful. The following comments were written on the survey.

- *Difficulty logging on (three people wrote this)*
- *Difficult to participate for long periods*
- *I miss seeing the people who are participating. I cannot make new friends/ acquaintances during such a structured interaction.*
- *Often these webinars are not communicative. More of a one way.*
- *Too much screen and sitting time – on Zoom for work all day.*
-

Programs geared toward the “older” seniors

Remarks on the survey and in interviews suggest that some people think programming at the Center at the Heights is geared toward the “elderly” and may not meet the needs of people in their 60s. One key informant said that service providers “need to look at the continuum of aging; there are distinct groups with distinct needs, and we miss opportunities to know and serve all the needs.”

- *I wish your services were not directed toward the older who are elderly, nothing seems to be directed at the young old. Survey*
- *I was hoping this survey addressed if our local senior center is meeting the needs of the seniors in their 60’s. Most of us feel it is not. Survey*

Accommodating pedestrians

Although pedestrian safety was not identified as a concern in the 2022 Healthy Aging Assessment, the need for more benches around town came up in the survey and in some focus groups. Most notably, in the focus group at the Seabeds Needham Housing Authority property, several people identified the long hill leading from the development as an impediment to getting to other parts of the town. Comments on the survey also suggested that more benches would be helpful for walkers.

- *More benches to sit on in town. Survey*
- *I walk from home for exercise. My back sometimes acts up, but benches seem rare. Survey*

Limitations of this assessment

Diversity and representation

In recent years, many organizations in Needham, including Town administration and departments, have examined, or have committed to addressing the lack of diversity in town and the experiences of those who are not in the majority. Unfortunately, the Survey on Healthy Aging in Needham did not include questions directly related to diversity, equity, and inclusion, even though the Department of Health and Human Services understands racism as a public health issue. Given that racism and

discrimination have profound implications for isolation, loneliness, and mental health, any future assessments must include this perspective.

The survey was translated into Mandarin and Russian (the predominant languages among Needham residents who do not speak English), and three surveys were completed in each of those languages. However, there were no focus groups for other language speakers. In an interview with Needham Housing Authority staff members, one person remarked, “Language barriers lead to isolation”.

Black, Hispanic, and Asian people were largely under-represented among survey respondents, while White residents were over-represented. Needham’s racial makeup in 2021² was 86.1% White, 2.8% Black, .1% Native, 8.7% Asian, 2.6% Hispanic. However, less than 1% of respondents were Black, 2.8% were Asian, and less than 1% were Hispanic, while 91.9% were White. Five percent of survey respondents identified some other way or preferred not to answer. Racial identities of focus group participants and key informants are unavailable.

In addition to the possible limitations noted above, it is important to point out that due to time constraints of the data collection period, there were some community groups or possible key informants who may not be included. Individual and group scheduling challenges, as well as a finite amount of staff time, prohibited data collection from being truly exhaustive.

Summary

As in 2016, Needham remains a place where older people want to live. Many enjoy programs available to them through the Aging Services Division and the Community Council and have long-term connections in the community.

However, most of the dominant worries in 2016 (being able to stay in Needham despite unaffordability, limited small housing stock, difficulty making homes age-friendly, lack of transportation, and pedestrian safety) were identified as concerns in 2022 as well.

There is also a worrisome subset of older residents who report not being connected, feeling isolated or lonely, or having infrequent or rare interaction with others. Some older adults indicate that their social world has not rebounded to pre-pandemic connections.

As described in the survey data report in Appendix A (Findings – Additional Comments, and Table 25), comments could be grouped into several categories. These groupings – community services and programs; transportation; housing; taxes; and community infrastructure and retail – were also found in focus groups and interviews, along with cost of living.

The most consistent themes among all three data gathering modes were:

- Housing (limited options for downsizing, lack of affordable housing, limited availability, desired changes to accessory dwelling unit bylaw)
- Transportation (need for more options, free or reduced cost ridesharing, rides to medical appointments, general lack of transportation options)
- Cost of living (housing, food, real estate taxes)

² [U.S. Census](#)

- Community services & programs (positive reports about existing services, desire for other programming, need for better communication regarding existing services; need help finding and contracting with private services)

Next steps

Many of these issues can only be adequately addressed with system-wide strategies. The most seemingly intractable challenge faced by older residents is how to continue living in Needham with housing as limited and expensive as it is. While other bodies have been wrestling with this complex dilemma as it affects all Needham residents and prospective buyers, the responses gathered through this assessment should be considered going forward.

At the same time, policy and program developers can review this assessment and find ways to address other concerns raised by older adults. Some approaches might include:

- Publicize the tax abatement program to address rising real estate taxes.
- Publicize existing transportation programs available to older adults in Needham.
- Encourage older adults to conduct or request safety audits of their homes to identify possible improvements for accessibility and safe aging at home.
- Change the accessory dwelling unit by-law to allow more flexibility in residency requirements.
- Review existing bench locations throughout Needham and identify sites where additional benches would benefit residents.
- Seek input from adults at the lower end of the senior age spectrum (adults in their 60s and 70s) to learn what additional programming would meet their needs.
- Employ creative outreach to identify and reach out to isolated seniors.

Issues to pursue in the future

1. Any future discussions about isolation or loneliness among older adults in Needham must include identity issues that may contribute to those feelings. In this predominantly White and affluent community, experiences of racial identity, sexual orientation, gender identity, socioeconomic status, or religion must be considered.
2. Approximately one-third of respondents reported that they have provided care for another adult living in their household – 29% did so in the past and 6% were currently providing care. The impact of such responsibility on the health and well-being of the caregiver can be extraordinary. The Needham Aging Services Division offers a monthly support group for such caregivers. Whether that service is reaching all who would benefit, or if there are or could be other programs to serve the needs of caregivers, should be considered.
3. Several aspects of getting health care were identified as problems by many respondents. They included transportation; inaccessible office buildings; delaying care due to worry about exposure; lack of provider availability; and lack of mental health providers. It would be useful to further explore these health care access issues and address the causes.



SURVEY ON HEALTHY AGING IN NEEDHAM

Technical Report
October 2022



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SUMMARY OF FINDINGS

The Needham Department of Health and Human Services conducted a survey of Needham residents ages 60 and older to gather information on factors associated with healthy aging. This report presents findings from 738 Needham seniors who took part in the survey during summer 2022.

Respondent Characteristics (Page 6)

Survey respondents predominantly identified as *female* (68%) and *male* (31%). An additional 0.5% identified as a member of the transgender community, non-binary, or gender non-conforming; and 0.7% preferred not to report how they identify their gender. On average, respondents were 73 years of age (range: 60 years to 99 years). The largest proportion of respondents identified as *White* (92%) or *Asian* (3%). Most respondents (92%) felt that their health was *good*, *very good*, or *excellent* in comparison to their peers. Roughly half of respondents (52%) reported that their 2022 pre-tax household income was *less than \$100,000* and half (48%) indicated that it was *\$100,000 or greater*. Approximately one-third of respondents (35%) reported that they have provided care for another adult living in their household – 29% did so in the past and 6% are currently providing care.

Residence in Needham (Page 9)

Almost all respondents (92%) reported that they are currently living in a *private residence* with close to eight of every ten respondents (79%) reporting that they are currently living in a *single-family home*. Seventy percent of respondents (70%) reported living in a multi-person household, with over half living in a two-person household (55%).

Food and Cost of Living (Page 10)

Overall, 16% of respondents reported some degree of difficulty with different aspects of *food access* in the 12 months prior to the survey such as finding the kind of food they wanted, 8% reported that they were *not able to prepare or cook food* due to health problems, and 6% reported some degree of difficulty with different aspects of food security such as not being able to afford to eat balanced meals. Half of respondents (49%) expressed some degree of worry about cost of living (food, gas, heating oil, electric, housing) and its impact on their financial security this year. Worry about cost of living and its impact on financial security was inversely related to annual household income, particularly among those with annual household income under \$50,000.

Accessing Health Care (Page 12)

One quarter of respondents (25%) indicated that they delayed seeking health care during the past 6 months. The most common reason for delaying health care was *worry about exposure to the COVID-19 virus* (16% of all respondents). Twenty percent (20%) of respondents reported difficulty accessing health care during the past 6 months due to lack of provider availability or long wait times. Additional open-ended comments identified *limited provider availability* and *difficulty scheduling appointments* as posing barriers to accessing health care.

Technology (Page 13)

Almost all respondents (96%) indicated that they use the internet for things like email, getting information, paying bills, or purchasing, with an equal proportion (96%) reporting that they have internet access at home, and 90% reporting that they use the internet *daily*. Internet use was associated with age of the respondent. All respondents within the 60-64 year old age group reported at

least monthly internet use, while 14% of individuals 85 years of age and older reported that they never go online. Rates of internet access at home were highest among respondents 60-64 years of age (99%) and lowest among respondents 85 years of age and older (90%).

Almost all respondents reported that they use a *smart phone or mobile phone* (93%), followed by a *laptop computer* (66%), *tablet* (56%), *desktop computer* (49%), and *electronic reader* (32%). On average, respondents reported that they currently use 2.95 different types of technology. In general, use of different types of technology varied by the age of the respondent. This difference was most pronounced for use of laptop computers – which were used by 88% of respondents 60-64 years of age and 36% of respondents 85 years of age and older.

The most common sources of technical support were *friends or family* (70%), followed by *online search or chat groups* (38%), and a *store or service* (26%). Additional open-ended comments identified using a *private service or consultant* or obtaining technical support through their *workplace*. The proportion of respondents who reported that they access technical support through *online search or chat groups* was inversely related to age, ranging from 48% of respondents in the 60-64 year old age group to 19% of respondents 85 years of age or older. There was little variation by age in reports of accessing other types of technical support.

It is important to note that 84% of the responses to this survey were received online – which may introduce upward bias in estimates of internet use. One quarter (24%) of those who completed the survey on paper reported that they *never go online*, suggesting that the survey likely over-estimates internet use among residents 60 years and older in Needham.

Social Connections (Page 16)

Approximately half of respondents indicated that they felt *somewhat* connected to the community (48%) with remaining respondents split between feeling *not very/not at all* connected (24%) and *very/extremely* connected (27%). Over a quarter (29%) reported feeling *less connected* to the community, since the outset of the COVID-19 pandemic.

Most respondents (71%) reported *never/rarely* feeling isolated or lonely (lacking companionship, feel left out, isolated from others), 24% felt this way *sometimes*, and only 5% felt isolated or lonely *often*. Individuals who lived in a single-person household were more likely than those who lived in a multi-person household to report feeling isolated or lonely. Over a third (37%) reported feeling *more isolated or lonely* since the outset of the COVID-19 pandemic.

Almost all respondents reported at least weekly contact with other individuals *in person* (94%) or on a *telephone or cell phone* (93%). Respondents reported participating in video calls less often. Across the three different modalities of communication, almost all respondents (98%) reported some form of either *daily* (86%) or *weekly* (12%) interaction with other people. Roughly one quarter (23%) reported speaking with people *less than before the pandemic*.

Errands and Social Activities (Page 20)

Approximately three-quarters of respondents (76%) indicated that they felt *very* or *extremely comfortable* leaving their home to run errands, go to doctor appointments, get groceries, or participate in social activities. Over a third (38%) reported feeling *less comfortable* running errands since the COVID-19 pandemic.

Two-thirds of respondents reported participating in social activities *in person* at least once a month (66%) and over half (54%) reported participating in social activities *online* at least once a month. Across the two different modalities, over three-quarters of respondents (77%) reported participating in social activities *in person* and/or *online* at least once a month and 24% reported participating in social activities less than once a month or never. Over half of respondents expressed a preference to participate in programs *in person* (59%). The remaining 41% of respondents were split between having *no preference* (25%) and preferring to participate *online* (17%). A subset of respondents (10%) indicated feeling unable to participate in certain activities because they are online. *Not knowing how to use the technology* (5% of all respondents) was the most common reason.

Home Modifications (Page 23)

Almost half of all respondents (49%) reported that they made one or more modifications to their home to enable them to stay there as they age. The largest proportion reported that they made modifications to their *bathroom* (37%) or *improved lighting* (20%). Across the respondent sample, 26% indicated that they were not able to make the modifications that they wanted to make. The most common reasons were the *cost of the modification* (16%) and *architecture of the home* (11%).

Transportation (Page 25)

Respondents were most likely to report that they sometimes or very often need transportation outside of Needham for *medical appointments* (42%), *visiting friends or relatives* (37%), *shopping* (36%), and *non-medical appointments* (31%). Regarding modes of transportation, respondents were most likely to report they sometimes or often *drive themselves* (89%), *walk* (57%), or *have others drive them* (30%).

Additional Comments (Page 26)

Respondents were invited to provide additional comments. Qualitative thematic analysis extracted five discrete themes related to community services and programs, transportation, housing, taxes, and community infrastructure and retail. In general, respondents were laudatory of existing community services for seniors, provided recommendations for community services they would like to see added, expressed desire for more transportation options for seniors (including free or reduced cost options), are concerned about housing availability and affordability (particularly for those wishing to downsize or stay in place as they age), advocated for tax exemptions for seniors (including property taxes), and made recommendations for senior-friendly community infrastructure modifications.

BACKGROUND AND METHODS

The Needham Department of Health and Human Services conducted a survey of Needham residents ages 60 and older to gather information on factors associated with healthy aging. The survey asked questions in nine broad domains: (1) demographics, (2) living situation, (3) food and cost of living, (4) health care access, (5) technology utilization, (6) social connections, (7) errands and social activities in the community, (8) home modifications to facilitate healthy aging, and (9) transportation methods.

The anonymous survey, which consisted of 69 discrete questions, was administered as both a paper-based and online questionnaire during the nine-week period between June 29 and August 31, 2022. Respondents were given the option to complete the survey online or to complete and return the paper-based version to the Rosemary Recreation Complex, the Needham Community Council, the Center at the Heights, or at Town Hall. This was the first time the Survey on Healthy Aging in Needham was conducted.

Survey Development

The survey instrument was designed by representatives from the Needham Department of Health and Human Services in collaboration with an Advisory Group. Many of the questions in the survey were either taken verbatim or adapted from items in existing surveys such as the AARP Community Survey Questionnaire and the Massachusetts Department of Public Health's COVID-19 Community Impact Survey.^{1,2} The survey instrument was available in English and was also professionally translated into Mandarin and Russian.

Data Accuracy

One of the challenges associated with survey research is the potential for error in the dataset. This can stem from multiple sources such as the same respondent submitting multiple surveys, poor question wording, lack of appropriate response options that accurately reflect the experiences of all potential respondents, frivolity, and misinterpretation of the underlying meaning of a question. Several steps were taken to minimize error and increase confidence in the results.

1. Use of clear and unambiguous language in the instructions – prominently indicating who the intended audience was and indicating what the questions were about.
2. Data screening – visual and statistical screening to identify and remove cases in which the respondent provided obviously frivolous or erroneous responses.
3. Identical case analysis – statistical identification of duplicate records to minimize the chances that the same person submitted multiple surveys and/or the chances that the survey was accidentally submitted multiple times.

While these are not failsafe methods, they do help to ensure a clean dataset that minimizes the chances that there are gross errors present in the final set of data.

¹ <http://www.aarp.org/livable-communities/info-2014/aarp-community-survey-questionnaire.html>

² <https://www.mass.gov/resource/covid-19-community-impact-survey>

Analysis Plan

Descriptive statistics are presented for each question in the survey (i.e., the number and percentage of all respondents that answered each response option for each item in the questionnaire). Some of the questions in the survey allowed respondents to write-in (or type-in) a response. These items were thematically coded to extract major themes.

Analytical Sample

A total of 766 individuals initiated the survey – 644 participated online and 122 submitted a paper-based version. Twenty-eight surveys (4%) were removed from the final analytical sample – 19 surveys were removed because the respondent only answered the first series of demographic questions without going any further and 9 surveys were removed because the respondent reported that they were under 60 years of age. The final analytical sample consisted of 738 individuals.

Generalizability

Results are generalizable only to those Needham residents ages 60 and older who took part in the survey and may not reflect the experiences and needs of other seniors in the community. The 2020 American Community Survey (ACS) estimates that there are 7,884 residents ages 60 and older living in Needham. Based on these estimates, the Survey on Healthy Aging in Needham reached approximately 9.4% of this population. See Table 1.

Table 1: Estimated Sample Size and Response Rate

	ACS 2020 Population Estimate	Needham Survey on Healthy Aging	Estimated Percentage
60-64 years	1,816	104	5.7%
65-74 years	3,170	320	10.1%
75-84 years	1,579	246	15.6%
85 years and over	1,319	68	5.2%
Total	7,884	738	9.4%

FINDINGS – RESPONDENT CHARACTERISTICS

Six questions in the survey asked about different respondent characteristics. These questions included the respondent's gender identity, age, racial/ethnic identity, perceived health status, pre-tax household income in calendar year 2022, and whether they are a care provider for another adult.

Gender Identity

Respondents were asked how they identify their gender on a scale that included response options for female, male, transgender female, transgender male, non-binary or gender non-conforming, some other way, and prefer not to answer.

Approximately two-thirds of respondents (68%) identified their gender as *female* and 31% identified as *male*. An additional 0.5% identified as a member of the transgender community, non-binary, or gender non-conforming; and 0.7% preferred not to report how they identify their gender. See Table 2.

Table 2: Gender Identity (n=738)

	Number	Percentage
Female	502	68.0%
Male	227	30.8%
Transgender Female	1	0.1%
Transgender Male	2	0.3%
Non-binary or gender non-conforming	1	0.1%
Some other way	0	0.0%
Prefer not to answer	5	0.7%



Respondent Age

Respondents were asked to indicate their exact age. During the analysis phase, responses were collapsed into five-year intervals. Respondents ranged in age from 60 years of age to 99 years of age. The average age of respondents was 73 years. Separated into five-year increments, the largest proportion of respondents (24%) were between 71 and 75 years of age. See Table 3.

Table 3: Years of Age (n=738)

	Number	Percentage
60-65 years	137	18.6%
66-70 years	149	20.2%
71-75 years	177	24.0%
76-80 years	145	19.6%
81-85 years	72	9.8%
86-90 years	43	5.8%
91-95 years	8	1.1%
96-100 years	7	.9%

Racial/Ethnic Identity

Respondents were asked to indicate how they identify their race/ethnicity according to the categories from the U.S. Census. Respondents could choose more than one category (including the option to identify in some other way or to opt out of answering the question).

The largest proportion of respondents identified as *White* (92%) or *Asian* (3%). Fewer than 1% identified as *Black or African American* (0.3%), *Hispanic or Latino(a)* (0.3%), or *Native American or Alaska Native* (0.4%). An additional 2.4% of respondents indicated that they identify in *some other way* than the categories listed and 2.6% preferred not to report how they identify their race/ethnicity.

Based on estimates from the 2020 American Community Survey (ACS), 95% of Needham residents over 60 years of age identify as *White*, 3.0% as *Asian*, 1.6% as *Black or African American*, and 0.4% as *Hispanic or Latino(a)*. Although not a perfect comparison, this suggests that the findings in this survey may slightly over-represent the views of White residents over 60 and under-represent the views of Black or African American residents over 60 living in Needham. See Table 4.

Table 4: Racial/Ethnic Identity (n=738)

	Number	Percentage ^(a)
Black or African American	2	0.3%
Asian	21	2.8%
Hispanic or Latino(a)	2	0.3%
Native American or Alaska Native	3	0.4%
White	678	91.9%
Native Hawaiian or Pacific Islander	0	0.0%
Some other way	18	2.4%
Prefer not to answer	19	2.6%

^(a) Respondents could choose more than one option so percentages may sum to more than 100%.

Perceived Health Status

Respondents were asked to indicate how they would rate their health (in general) in comparison to other people their age on a five-point scale ranging from Poor to Excellent. Most respondents (92%) felt that their health was *good*, *very good*, or *excellent* in comparison to their peers. Eight percent (8%) of respondents reported that their health was *fair* (7%) or *poor* (1%) when compared to other individuals in their age cohort. See Table 5.

Table 5: Perceived Health Status (n=730)

	Number	Percentage
Poor	10	1.4%
Fair	51	7.0%
Good	161	22.1%
Very Good	310	42.5%
Excellent	198	27.1%
Missing	8	-

Household Pre-Tax Income in Calendar Year 2022

Respondents were asked to estimate their household's pre-tax income level during the current federal tax year (calendar year 2022). Respondents were evenly distributed across household income levels. Roughly half of respondents (52%) reported that their 2022 pre-tax household income was less than \$100,000 and half (48%) indicated that it was \$100,000 or greater. The largest group (21%) reported that their 2022 pre-tax household income was between \$100,000 and \$149,000. See Table 6.

Table 6: Household Pre-Tax Income in Calendar Year 2022 (n=651)

	Number	Percentage
Less than \$25,000	63	9.7%
\$25,000 to \$49,999	63	9.7%
\$50,000 to \$74,999	97	14.9%
\$75,000 to \$99,999	117	18.0%
\$100,000 to \$149,999	137	21.0%
\$150,000 to \$199,999	80	12.3%
\$200,000 to \$249,999	45	6.9%
\$250,000 or more	49	7.5%
Missing	87	-

Care Provider for Another Adult

Respondents were asked to indicate whether they have ever provided care for another adult living in their household who needed assistance with everyday tasks. Approximately one-third of respondents (35%) reported that they have provided care for another adult living in their household – 29% did so in the past and 6% are currently providing care. See Table 7.

Table 7: Care Provider for Another Adult (n=719)

	Number	Percentage
No	469	65.2%
In the past, but not currently	205	28.5%
Yes, I am currently providing care	45	6.3%
Missing	19	-

FINDINGS – RESIDENCE IN NEEDHAM

Three questions in the survey assessed the setting in which respondents currently live, the type of residence in which they live, and the number of individuals living in the household.

Residence Setting

Respondents were asked to identify the setting in which they currently live according to five categories. Almost all respondents (92%) reported that they are currently living in a *private residence*. Four percent (4%) are currently living in a *Needham Housing Authority property*, 2% in *senior housing*, 2% in *affordable housing (Chapter 40B)*, and 0.3% in a *long-term care facility*. See Table 8.

Table 8: Residence Setting (n=729)

	Number	Percentage
Private residence	670	91.9%
Affordable housing (Chapter 40B)	14	1.9%
Needham Housing Authority Property	26	3.6%
Senior housing	17	2.3%
Long-term care facility	2	0.3%
Missing	9	-

Type of Residence

In addition to identifying the setting in which they currently live, respondents were asked to indicate the type of home in which they currently live. Close to eight of every ten respondents (79%) reported that they are currently living in a *single-family home*. Fourteen percent (14%) of respondents are currently living in an *apartment*, 4% in a *condominium*, 3% in a *town home or duplex*, and 0.3% in an *accessory dwelling unit*. See Table 9.

Table 9: Type of Residence (n=733)

	Number	Percentage
Single family home	579	79.0%
Town home or duplex	21	2.9%
Apartment	99	13.5%
Condominium	32	4.4%
Accessory dwelling unit (attached apartment)	2	0.3%
Missing	5	-

Number of Persons in Household

Respondents were asked to indicate how many individuals live in their household. Responses ranged from 1 individual to 9 individuals. Seventy percent of respondents (70%) reported living in a multi-person household, with over half living in a two-person household (55%). See Table 10.

Table 10: Number of Persons in Household (n=733)

	1 person	2 people	3 people	4 people	5 or more
Persons in Household	30.4%	55.3%	9.0%	3.4%	1.9%

There were 5 missing responses.

FINDINGS – FOOD AND COST OF LIVING

Seven questions in the survey assessed areas related to food and cost of living. Respondents were asked whether they had experienced any issues accessing, preparing, or affording food in the past 12 months and to indicate how worried they are about cost of living.

Food Access, Preparation, and Security

Sixteen percent of respondents (16%) reported some degree of difficulty with different aspects of food access in the 12 months prior to the survey – 12% reported difficulty *finding the kind of food they wanted*, 5% reported difficulty *getting transportation to the grocery store*, and 5% reported difficulty *having groceries delivered*.

Eight percent of respondents (8%) reported that they were *not able to prepare or cook food* during the past 12 months because of health problems.

Six percent (6%) reported some degree of difficulty with different aspects of food security during the 12 months prior to the survey – 5% reported feeling that they *could not afford to eat balanced meals* and 4% reported *worrying that their food would run out* before they could get more. See Table 11.

Table 11: Food Access, Food Preparation, Food Security (n=686)

Food Access	Number	Percentage
You had difficulty finding the kind of food that you wanted	84	12.2%
You had difficulty getting transportation to the grocery store	37	5.4%
You had difficulty having groceries delivered	34	5.0%
Food Preparation	Number	Percentage
You were not able to prepare or cook food because of health problems	52	7.6%
Food Security	Number	Percentage
You felt that you couldn't afford to eat balanced meals	31	4.5%
You worried that your food would run out before you could get more	26	3.8%

Each row was asked as a Yes/No question. Percentages represent “Yes” responses. There were 52 missing responses.

Cost of Living

Respondents were asked to indicate how worried they are about cost of living (food, gas, heating oil, electric, housing) and its impact on their financial security this year on a 5-point scale ranging from not at all worried to extremely worried. Half of respondents (51%) reported that they were either *not at all worried* or *not very worried* about the impact of cost of living on their financial security. The largest proportion reported that they were *somewhat worried* (35%). Only 14% reported that they were *very worried* or *extremely worried*. See Figure 1.

In general, worry about cost of living and its impact on financial security was inversely related to annual household income. Only 6% of respondents with annual household income over \$100,000 reported being *very* or *extremely* worried about cost of living. Among those with annual household income under \$100,000, almost one-quarter (23%) reported being *very* or *extremely* worried about cost of living. Among those with annual household income under \$50,000, a full 39% reported being *very* or *extremely* worried about cost of living.

Figure 1: Worry About Cost of Living (n=688)

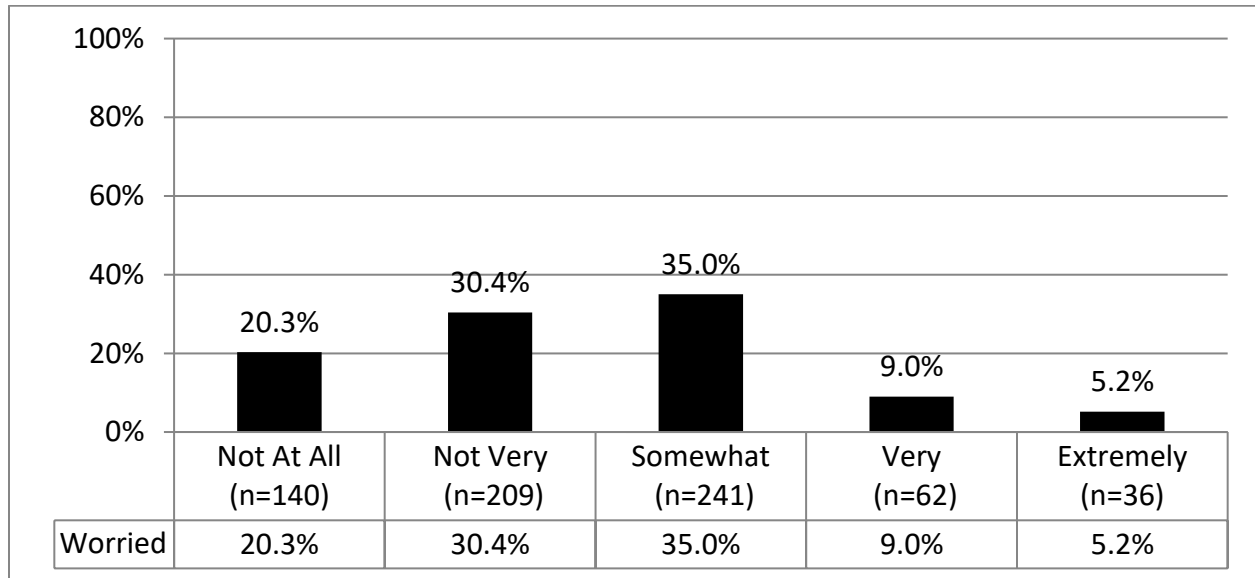


Figure Notes: A total of 688 individuals answered this question (50 missing). Mean = 2.48 out of 5.00.

FINDINGS – ACCESSING HEALTH CARE

Three questions in the survey asked respondents about delays accessing health care and difficulties accessing health care during the six months prior to the survey.

Delays Accessing Health Care

Respondents were asked to indicate which factors, if any, caused them to delay seeking health care during the six months prior to the survey. As shown in Table 12, most respondents (76%) reported that they either did not need health care during the past 6 months (8%) or had not delayed seeking care in that time (67%). One quarter (25%) indicated that they delayed seeking health care during the past 6 months. The most common reason for delaying health care was *worry about exposure to the COVID-19 virus* (16% of all respondents).

Table 12: Delays Accessing Health Care in the Past 6 Months (n=687)

Health Care in the Past 6 Months	Number	Percentage
Did not need health care	58	8.4%
Did not delay seeking health care	461	67.1%
Delayed seeking health care	168	24.5%
Missing	51	-
Reasons for Delaying Health Care in Past 6 Months	Number	Percentage ^(a)
Did not have transportation	23	3.3%
Worried about exposure to COVID-19	110	16.0%
Did not have anyone to go with	15	2.2%
Some other reason	37	5.4%

^(a) Respondents could choose more than one option so percentages may sum to more than 100%.

The 37 respondents who selected some other reason for delaying accessing health care were most likely to identify *limited provider availability* and *difficulty scheduling appointments* as the reason. The complete list of verbatim comments and themes appears in **Appendix A**.

Difficulty Accessing Health Care

Respondents were asked whether they had difficulty accessing health care during the past six months due to lack of provider availability or long wait times. Twenty percent (20%) of respondents reported difficulty accessing health care due to lack of provider availability or long wait times. See Table 13.

Table 13: Difficulty Accessing Health Care in Past 6 Months (n=666)

	Number	Percentage
Did not need health care	58	8.7%
No difficulty accessing health care	478	71.8%
Had trouble accessing health care	130	19.5%
Missing	72	-

FINDINGS – TECHNOLOGY

Nine questions in the survey asked respondents how often they typically use the internet, whether they have internet access at home, the types of technology they use, and sources of technical support.

Internet Use

Respondents were asked to indicate how often they typically use the internet for things like email, getting information, paying bills, or purchasing – including access from home, work, a mobile device, or someplace else. Almost all respondents (96%) indicated that they use the internet, with 90% reporting that they use the internet *daily*. Typical internet use was associated with age of the respondent. All respondents within the 60-64 year old age group reported at least monthly internet use, while 14% of individuals 85 years of age and older reported that they never go online.

Table 14: Typical Internet Use (n=671)

Use the Internet	Daily	Every Week	Twice a Month	Once a Month	Less than Once a Month	Never go Online
All Respondents (671)	89.7%	3.3%	0.9%	1.0%	1.0%	4.0%
60-64 years old (90)	95.6%	2.2%	1.1%	1.1%	0.0%	0.0%
65-74 years old (289)	93.1%	3.1%	1.4%	0.3%	0.3%	1.7%
75-84 years old (228)	85.5%	4.4%	0.4%	1.8%	2.2%	5.7%
85 years or older (64)	81.3%	1.6%	0.0%	1.6%	1.6%	14.1%

There were 67 missing responses.

It is important to note that 84% of the responses to this survey were received online. This may bias the results of this question and extent to which it is representative of all individuals 60 years of age and older in Needham. Almost all individuals who completed the survey online reported *daily* internet use (95%) compared to only 65% of those who completed it on paper. One quarter (24%) of those who completed the survey on paper reported that they *never go online*. This suggests that this question may greatly over-estimate typical Internet use among Needham residents 60 years of age and older.

Internet Access at Home

Respondents were asked to indicate whether they have internet at home (including internet access through a smartphone). Rates of internet access at home were highest among respondents 60-64 years of age (99%) and lowest among respondents 85 years of age and older (90%). Almost all respondents (96%) indicated that they have internet access at home. Among all respondents, *not having anyone to help them set it up or use it* (1.7%), *cost* (1.5%), and *lack of interest in having internet at home* (1.1%) were the primary factors preventing internet access at home. See Table 15.

Table 15: Internet Access at Home (n=664)

Internet Access at Home	Number	Percentage
Yes	639	96.2%
No	25	3.8%
Missing	74	-
Factors Preventing Internet Access at Home	Number	Percentage ^(a)
I am not interested in having internet at home	7	1.1%
It costs too much money	10	1.5%
I don't have anyone to help me set it up or use it	11	1.7%
Some other reason	0	0.0%

^(a) Respondents could choose more than one option so percentages may sum to more than 100%.

Type(s) of Technology Used

Respondents were asked whether they currently use five different types of technology. Almost all respondents reported that they use a *smart phone or mobile phone* (93%), followed by a *laptop computer* (66%), *tablet* (56%), *desktop computer* (49%), and *electronic reader* (32%). On average, respondents reported that they currently use 2.95 different types of technology. A small proportion of individuals (1.7%) reported that they do not use any of these types of technology. See Table 16.

Table 16: Type(s) of Technology Used (n=662)

	Number	Percentage
Smart phone or mobile phone	614	92.7%
Desktop computer	325	49.1%
Laptop computer	437	66.0%
Tablet (such as iPad, Samsung, Fire)	368	55.6%
Electronic reader (such as Kindle)	212	32.0%
None	11	1.7%

Each row was asked as a Yes/No question. Percentages represent "Yes" responses. 76 missing.

In general, use of different types of technology varied by the age of the respondent. This difference was most pronounced for use of laptop computers – which were used by 88% of respondents 60-64 years of age and 36% of respondents 85 years of age and older.

Technology Used	Mobile Phone	Desktop Computer	Laptop Computer	Tablet	Electronic Reader	None
All Respondents (662)	92.7%	49.1%	66.0%	55.6%	32.0%	1.7%
60-64 years old (90)	100.0%	48.9%	87.5%	54.5%	30.7%	0.0%
65-74 years old (289)	96.2%	47.2%	72.9%	59.7%	33.0%	0.3%
75-84 years old (228)	90.7%	51.6%	56.9%	53.8%	35.1%	3.1%
85 years or older (64)	73.8%	49.2%	36.1%	44.3%	18.0%	4.7%

Technical Supports

Respondents were asked where they access technical support when they need it. Many respondents reported informal sources of support such as *friends or family* (70%), followed by *online search or chat groups* (38%), a *store or service* (26%), at the *library* (5%), at the *Center for the Heights* (4%), and at the *Needham Community Council* (1%). An additional 7% of respondents identified a different source of support. On average, respondents reported accessing 1.5 different sources of technical support. A small proportion of individuals (4.7%) did not identify any sources of technical support. See Table 17.

Table 17: Technical Supports (n=682)

	Number	Percentage ^(a)
Online search or chat groups	259	38.0%
A store or service (Best Buy, Apple Store)	179	26.2%
From family or friends	480	70.4%
At the library	33	4.8%
At the Center at the Heights (Senior Center)	25	3.7%
Needham Community Council	8	1.2%
Other source of support	46	6.7%
None	32	4.7%

^(a) Respondents could choose more than one option so percentages may sum to more than 100%. 56 missing.

The proportion of respondents who reported that they access technical support through *online search or chat groups* was inversely related to age, ranging from 48% of respondents in the 60-64 year old age group to 19% of respondents 85 years of age or older. There was little variation by age in reports of accessing other types of technical support.

Technical Supports	60-64 years	65-74 years	75-84 years	85 years or older
Online search or chat groups	47.8%	45.4%	30.3%	18.5%
A store or service (Best Buy, Apple Store)	15.2%	28.9%	28.6%	21.5%
From family or friends	68.5%	72.9%	68.4%	69.2%
At the library	3.3%	3.8%	6.4%	6.2%
At the Center at the Heights (Senior Center)	1.1%	2.4%	5.6%	6.2%
Needham Community Council	1.1%	1.4%	1.3%	0.0%
Other source of support	6.5%	5.2%	8.5%	7.7%
None	6.5%	2.4%	6.0%	7.7%

The 46 respondents who selected another source of support were most likely to identify using a *private service or consultant* or obtaining technical support through their *workplace*. The complete list of verbatim comments and themes appears in **Appendix B**.

FINDINGS – SOCIAL CONNECTIONS

A series of eight items in the survey asked respondents about their perceived level of connection to the community, feelings of isolation and loneliness, and level of interaction with other individuals.

Connection to the Community

Respondents were asked to indicate how connected they feel to the Needham community on a 5-point scale ranging from not at all connected to extremely connected. Approximately half of respondents indicated that they felt *somewhat* connected to the community (48%) with remaining respondents split between feeling *not very/not at all* connected (24%) and *very/extremely* connected (27%). Most respondents fell in the middle range of the scale with few respondents at the two anchor points: *not at all* connected (3%) and *extremely* connected (6%). See Figure 2.

Figure 2: Connection to the Community (n=694)

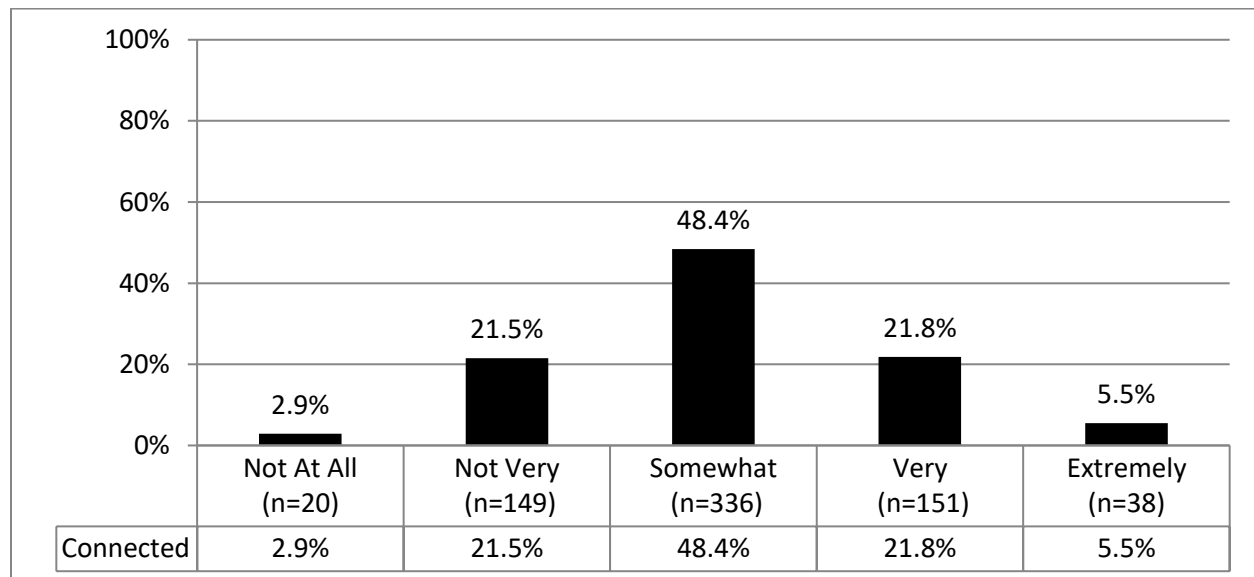


Figure Notes: A total of 694 individuals answered this question (44 missing). Mean = 3.05 out of 5.00.

Respondents were also asked to indicate how connected they feel to the Needham community now in comparison to their level of connection to the community before the COVID-19 pandemic. Ratings were provided on a 5-point scale ranging from much less connected now to much more connected now with a mid-point of no change. Most respondents reported *no change* (59%) in the level of connection they feel now in comparison to before the pandemic, 29% reported feeling less connected to the community, and 12% reported feeling more connected to the community. See Figure 3.

Figure 3: Connection to the Community Versus Before Pandemic (n=691)

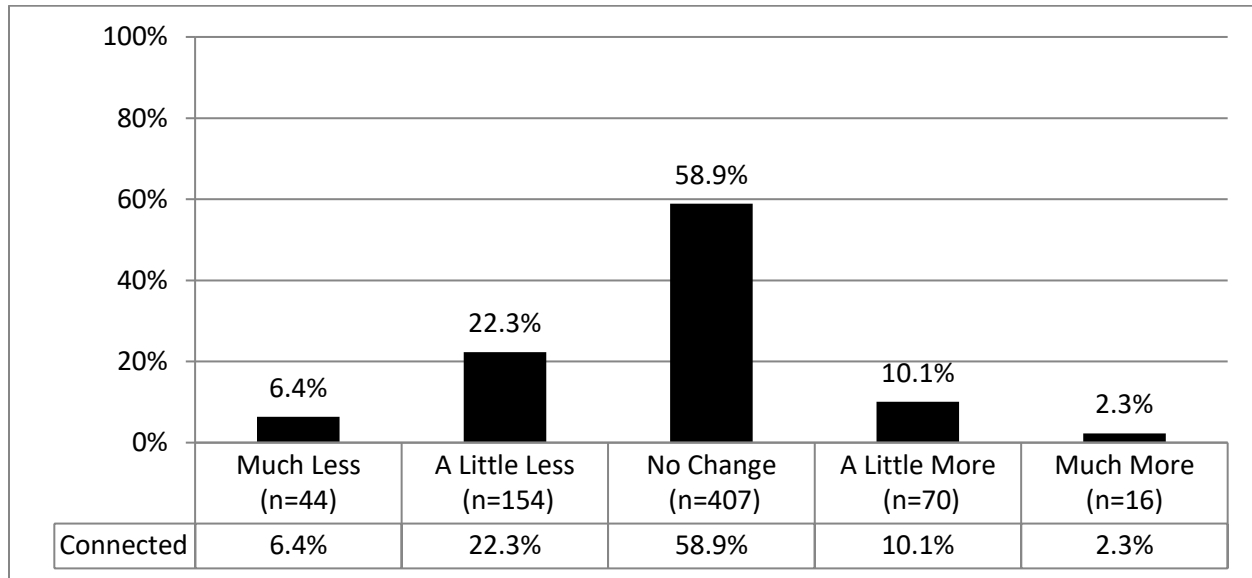


Figure Notes: A total of 691 individuals answered this question (47 missing). Mean = 2.80 out of 5.00.

Feel Isolated or Lonely

Respondents were asked to indicate how often they feel isolated or lonely (lacking companionship, feel left out, isolated from others) on a 4-point scale ranging from never through often. Most respondents (71%) reported *never/rarely* feeling isolated or lonely, 24% felt this way *sometimes*, and only 5% felt isolated or lonely *often*. See Figure 4. Individuals who lived in a single-person household were more likely than those who lived in a multi-person household to report feeling isolated or lonely (*sometimes*: 34% single-person vs. 20% multi-person; *often*: 12% single-person vs. 2% multi-person).

Figure 4: Feel Isolated or Lonely (n=693)

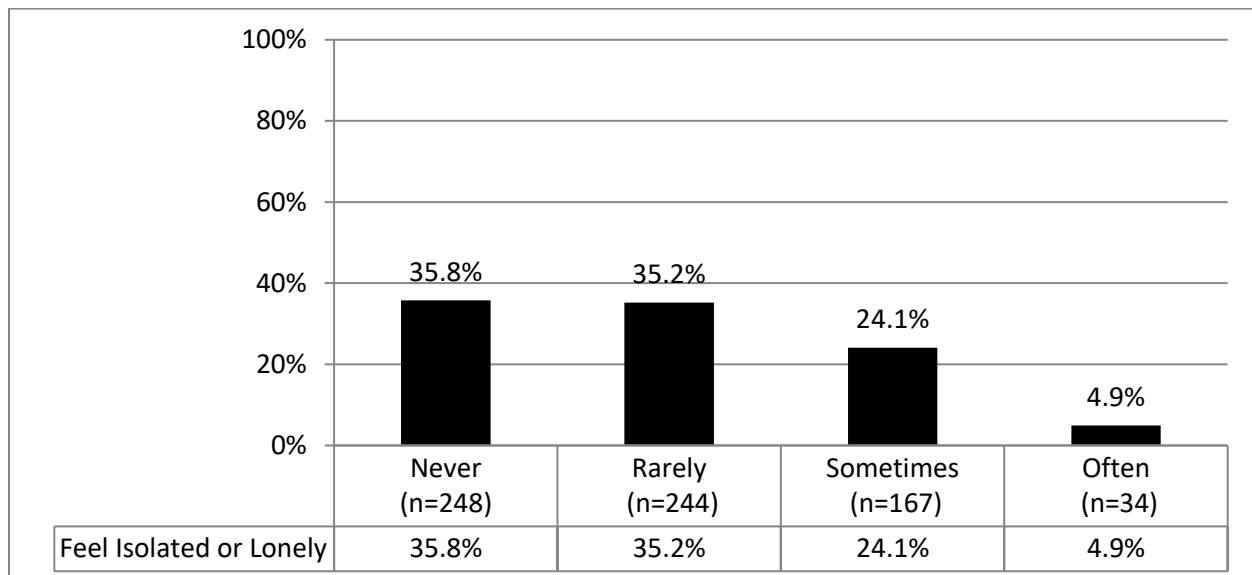


Figure Notes: A total of 693 individuals answered this question (45 missing). Mean = 1.98 out of 4.00.

Respondents were also asked to indicate how isolated or lonely they feel now in comparison to before the COVID-19 pandemic. Ratings were provided on a 5-point scale ranging from much less isolated or lonely now to much more isolated or lonely now with a mid-point of no change. Half of respondents reported *no change* (50%) in isolation or loneliness in comparison to before the pandemic, 37% reported feeling more isolated or lonely, and 13% reported feeling less isolated or lonely. See Figure 5.

Figure 5: Feel Isolated or Lonely in Comparison to Before COVID-19 Pandemic (n=693)

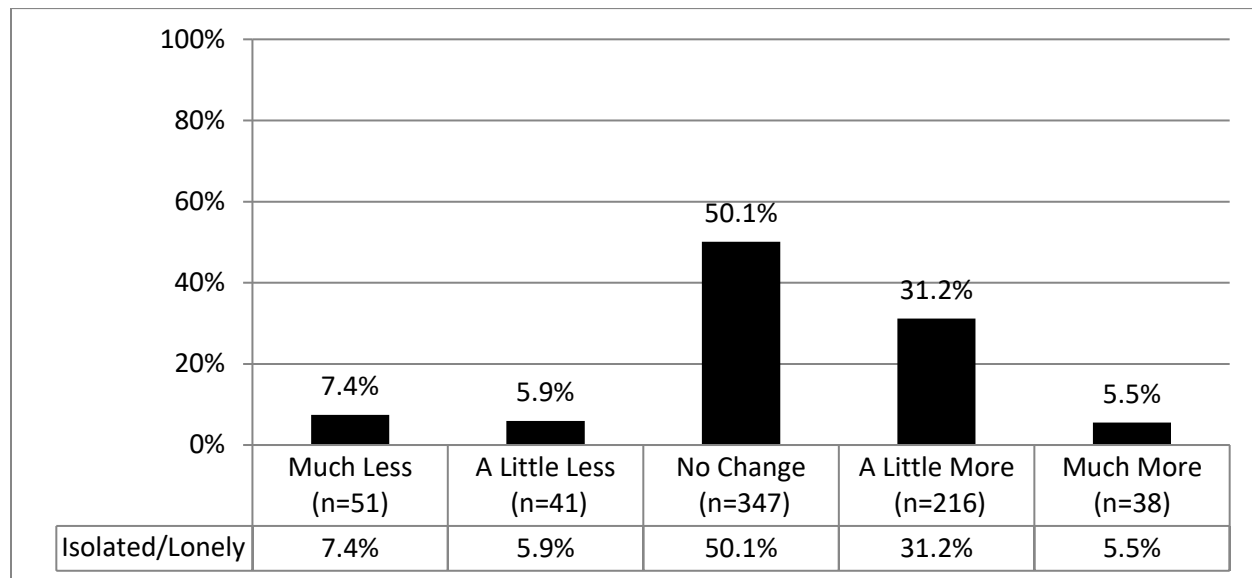


Figure Notes: A total of 693 individuals answered this question (45 missing). Mean = 3.22 out of 5.00.

Interaction with Other Individuals

Respondents were asked to indicate how often they usually speak with other people in person, on a telephone or cell phone, and on a video call such as Zoom or Facetime. As shown in Table 18, almost all respondents reported at least weekly contact with other individuals *in person* (94%) or on a *telephone or cell phone* (93%). Respondents reported participating in video calls less often.

Across the three different modalities of communication, almost all respondents (98%) reported some form of either *daily* (86%) or *weekly* (12%) interaction with other people.

Table 18: Interaction with Other Individuals (n=694)

	Daily	Every Week	Twice a Month	Once a Month	Less than Once a Month	Hardly Ever or Never
In person	71.8%	22.5%	3.0%	0.3%	0.7%	1.7%
Telephone or cell phone	65.9%	27.1%	3.2%	1.2%	1.0%	1.7%
Video call (Zoom, Facetime)	9.7%	31.4%	12.4%	8.1%	9.4%	29.1%
Any Method	86.3%	11.7%	1.2%	0.4%	0.3%	0.1%

There were 44 missing responses.

Respondents were also asked to indicate how frequently they are speaking with people now in comparison to before the COVID-19 pandemic. The largest proportion of respondents reported *no change* (68%) in their frequency of communication with others now in comparison to before the pandemic, 23% reported speaking with people *less than before the pandemic*, and 8% reported speaking with people *more than before the pandemic*. See Figure 6.

Figure 6: Interaction with Other Individuals Versus Before Pandemic (n=693)

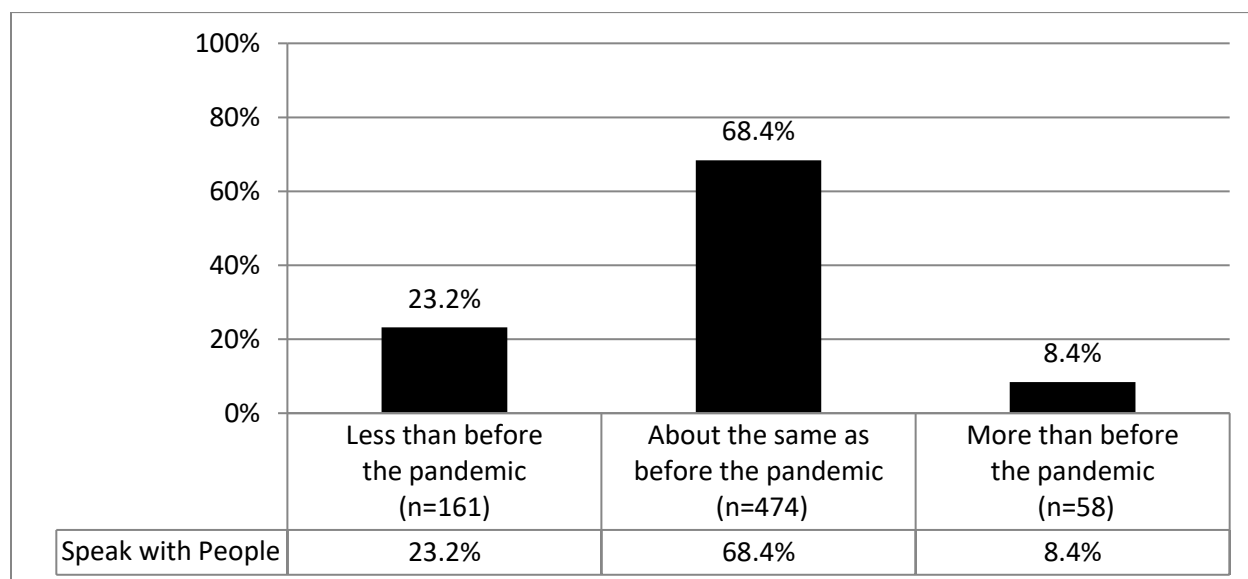


Figure Notes: A total of 693 individuals answered this question (45 missing).

FINDINGS – ERRANDS AND SOCIAL ACTIVITIES

Seven questions in the survey asked respondents about their comfort running errands and the extent to which they participate in social activities in the community.

Comfort Running Errands

Respondents were asked to indicate how comfortable they are leaving their home to run errands, go to doctor appointments, get groceries, or participate in social activities on a 5-point scale ranging from not at all comfortable to extremely comfortable. Approximately three-quarters of respondents (76%) indicated that they felt *very* (33%) or *extremely comfortable* (43%) running errands. Additional respondents were *somewhat* (18%), *not very* (5%), and *not at all comfortable* (1%). See Figure 7.

Figure 7: Comfort Running Errands (n=678)

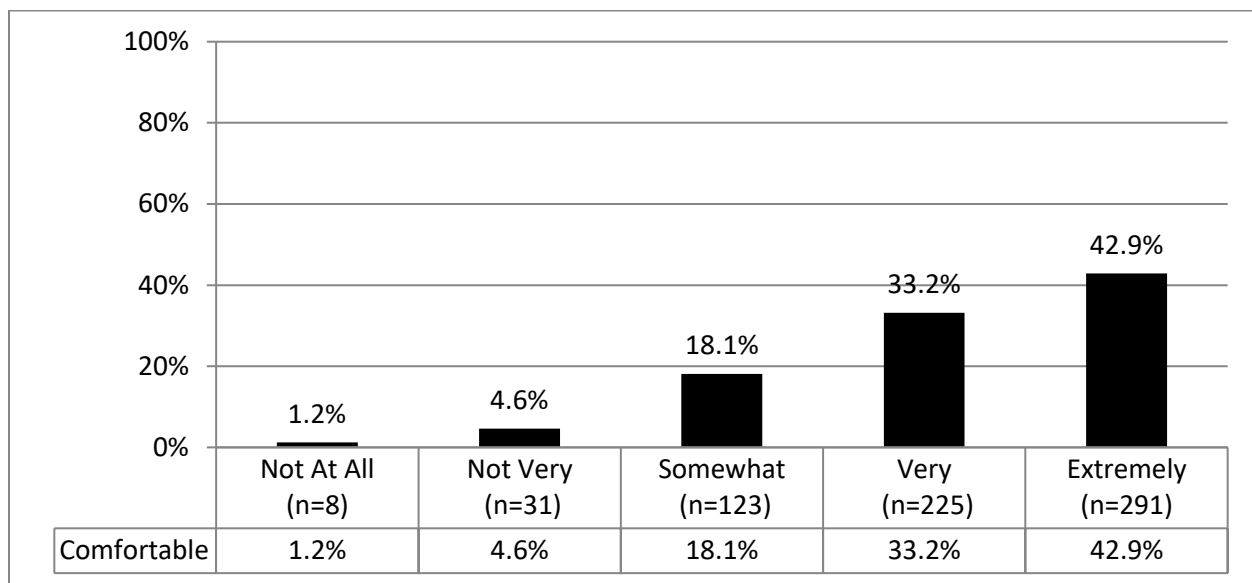


Figure Notes: A total of 678 individuals answered this question (60 missing). Mean = 4.12 out of 5.00.

Respondents were also asked to indicate how comfortable they are leaving their home to run errands, go to doctor appointments, get groceries, or participate in social activities now in comparison to before the COVID-19 pandemic. Ratings were provided on a 5-point scale ranging from much less comfortable now to much more comfortable now with a mid-point of no change. Half of respondents reported *no change* (49%) in their comfort level in comparison to before the pandemic, 38% reported feeling less comfortable, and 13% reported feeling more comfortable. See Figure 8.

Figure 8: Comfort Running Errands in Comparison to Before COVID-19 Pandemic (n=667)

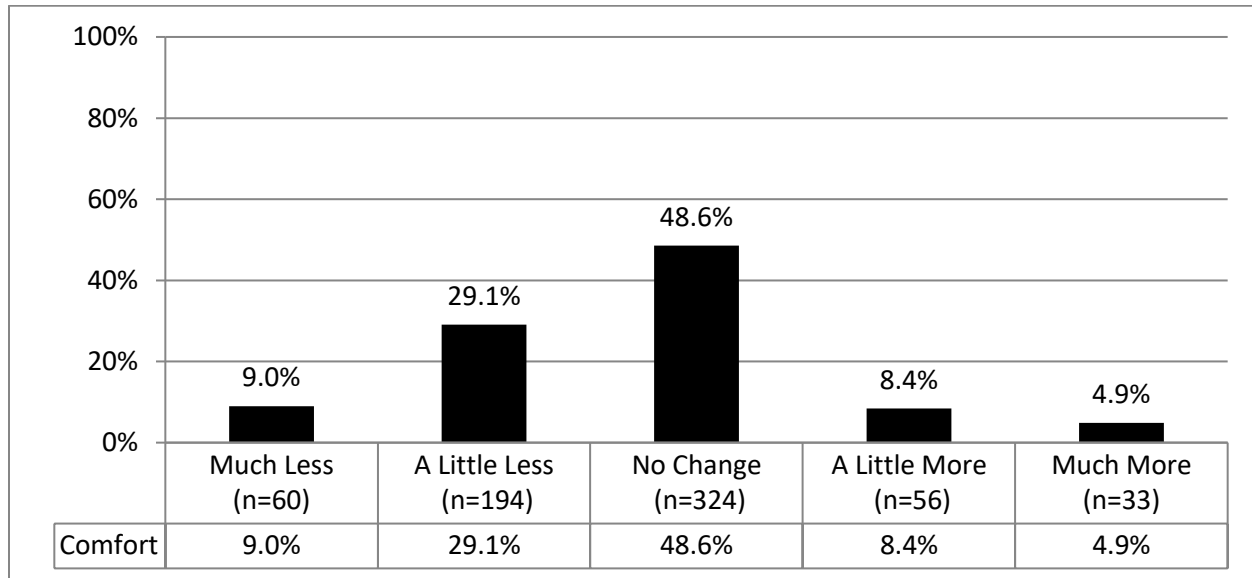


Figure Notes: A total of 667 individuals answered this question (71 missing). Mean = 2.71 out of 5.00.

Social Activities

Respondents were asked to indicate how often they currently participate in social groups, classes, recreation, or cultural events in person and online (such as Zoom). As shown in Table 19, two-thirds of respondents reported participating in social activities *in person* at least once a month (66%) and over half (54%) reported participating in social activities *online* at least once a month.

Across the two different modalities, over three-quarters of respondents (77%) reported participating in social activities *in person* and/or *online* at least once a month, while 24% reported that they participate in social activities less than once a month or never.

Table 19: Participation in Social Activities (n=665)

	Daily	Every Week	Twice a Month	Once a Month	Less than Once a Month	Never
In person	9.9%	36.8%	10.7%	8.3%	16.8%	17.4%
Online (such as Zoom)	5.1%	28.5%	12.3%	8.3%	17.2%	28.6%
Any Method	13.5%	46.3%	9.3%	7.5%	12.3%	11.2%

There were 73 missing responses.

Social Activities – Preferred Way to Participate

Respondents were also asked to indicate how they prefer to participate in programs (workshops, classes, cultural events, discussion groups, fitness). Response options were in person, online, no preference. As shown in Figure 9, over half of respondents expressed a preference to participate in programs *in person* (59%). The remaining 41% of respondents were split between having *no preference* (25%) and preferring to participate *online* (17%).

Figure 9: Preferred Way to Participate in Social Activities (n=666)

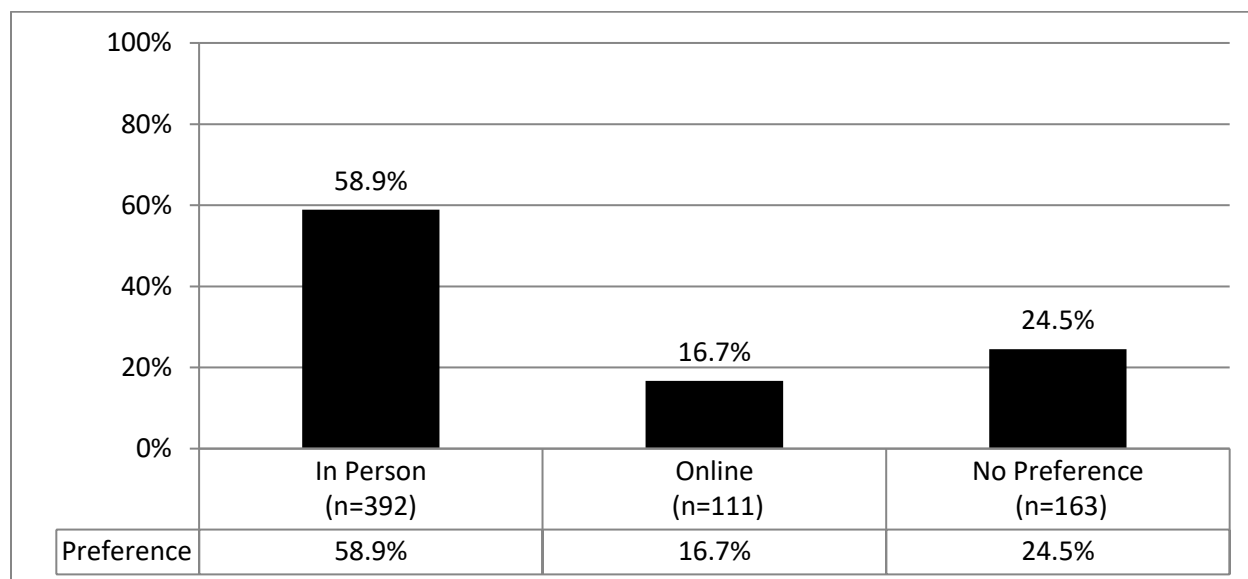


Figure Notes: A total of 666 individuals answered this question (72 missing).

Social Activities – Barriers to Participating in Online Activities

Respondents were asked whether they ever feel like they are unable to participate in certain activities because they are online – 10% of respondents reported feeling this way. Among all respondents, *not knowing how to use the technology* (5%) was the most common reason provided. See Table 20.

Table 20: Participating in Online Activities (n=666)

Feel Unable to Participate in Online Activities	Number	Percentage
No	597	89.6%
Yes	69	10.4%
Missing	72	-
Factors Preventing Participation in Online Activities	Number	Percentage ^(a)
No barriers	466	70.0%
No interest in participating in online activities	132	19.8%
Can't afford a computer or internet	6	0.9%
Don't know how to use the technology	33	5.0%
Don't have a good enough internet connection	5	0.8%
Don't have the right equipment (camera, microphone)	14	2.1%
Some other reason	22	3.3%

^(a) Respondents could choose more than one option so percentages may sum to more than 100%.

The 22 respondents who selected another reason were most likely to identify *health or physical factors* that prevent them from participating in online activities, *software or computing challenges*, or *schedule conflicts*. The complete list of verbatim comments and themes appears in **Appendix C**.

FINDINGS – HOME MODIFICATIONS

A series of 12 items in the survey asked respondents whether they had made modifications to their home to enable them to stay there as they age, whether they wanted to make modifications but were not able to, and barriers to making desired home improvements.

Existing Home Modifications

Almost half of all respondents (49%) reported that they made one or more modifications to their home to enable them to stay there as they age. The largest proportion reported that they made modifications to their *bathroom* (37%), followed by *improved lighting* (20%); *added a ramp or made other modifications to allow easier access* into or within their home (7%); *installed a medical emergency response system* (7%); *added a bedroom, bathroom, or kitchen on the first floor* (5%); and/or *added an accessory dwelling unit* (1%). See Table 21.

Table 21: Existing Home Modifications (n=662)

Made any modifications to home to enable them to stay there as they age	Number	Percentage
No	341	51.5%
Yes	321	48.5%
Missing	76	-
Have you made any of the following modifications to your home?	Number	Percentage ^(a)
Bathroom modifications (grab bars, handrails, higher toilet, non-slip tiles)	245	37.0%
Improved lighting	131	19.8%
A ramp, wider doorways, chairlift, or elevator to allow easier access	47	7.1%
Medical emergency response system that notifies others in an emergency	44	6.6%
Added a bedroom, bathroom, and/or kitchen on the first floor	33	5.0%
Added an accessory dwelling unit (an attached apartment)	6	0.9%
Other modification	13	2.0%
Missing	76	-

^(a) Each row was asked as a Yes/No question. Percentages represent “Yes” responses.

The 13 respondents who selected another type of modification were most likely to identify making *accessibility improvements* such as moving laundry equipment to the first floor, *assistive technology* to facilitate contacting emergency medical services, and *energy efficiency improvements* such as installing new windows. The complete list of verbatim comments and themes appears in **Appendix D**.

Barriers to Making Home Modifications

Respondents were asked whether they wanted to make modifications to their home that they have not been able to make. Across the respondent sample, 26% indicated that they were not able to make the modifications that they wanted to make. The most common reasons were the *cost of the modification* (16%) and *architecture of the home* (11%). See Table 22. Comments from the 4 respondents who selected another type of barrier appear in **Appendix D**.

Table 22: Making Home Modifications (n=667)

Prevented from Make Desired Modifications to Home	Number	Percentage
No	494	74.1%
Yes	173	25.9%
Missing	71	-
Barriers to Making Home Modifications	Number	Percentage ^(a)
No barriers	494	74.1%
Don't own property and not allowed to modify	16	2.4%
Cost of the modification	113	16.9%
Architecture of the home	72	10.8%
Building or zoning codes	23	3.4%
Finding a contractor	57	8.5%
Another barrier	4	0.6%

^(a) Each row was asked as a Yes/No question. Percentages represent "Yes" responses.

FINDINGS – TRANSPORTATION

Respondents were asked to indicate how often they need transportation outside of Needham and how often they currently utilize different modes of transportation to get around Needham.

Transportation Needs

Respondents were asked to indicate how often they need transportation outside of Needham for five different reasons such as work, shopping, and medical appointments. Scale categories ranged from Never (1) to Very Often (4). Respondents were most likely to report that they sometimes or very often need transportation outside of Needham for *medical appointments* (42%), *visiting friends or relatives* (37%), *shopping* (36%), and *non-medical appointments* (31%). See Table 23.

Table 23: Transportation Needs (n=645)

	Never	Rarely	Sometimes	Very Often	Mean ¹⁻⁴
Medical appointments	48.7%	9.0%	26.7%	15.7%	2.09
Visiting friends or relatives	56.6%	6.0%	22.6%	14.7%	1.96
Shopping	58.0%	6.2%	19.2%	16.6%	1.94
Non-medical appointments	57.4%	11.6%	21.4%	9.6%	1.83
Work	82.6%	3.9%	5.4%	8.1%	1.39

There were 93 missing responses.

Current Transportation Methods

Respondents were asked to indicate how often they currently use eight different modes of transportation to get around Needham for trips like shopping, visiting the doctor, visiting friends, and running errands. Scale categories ranged from Never to Very Often. Respondents were most likely to report they sometimes or often *drive themselves* (89%), *walk* (57%), or *have others drive them* (30%).

Table 24: Transportation Methods (n=655)

	Never	Rarely	Sometimes	Very Often	Mean ¹⁻⁴
Drive self	10.2%	1.2%	4.6%	84.0%	3.62
Walk	26.6%	16.9%	33.3%	23.2%	2.53
Have others drive	45.2%	24.6%	20.6%	9.6%	1.95
Use ride-sharing service like Uber or Lyft	69.3%	18.3%	9.2%	3.2%	1.46
Ride a bike	78.6%	10.1%	8.1%	3.2%	1.36
Use public bus or shuttle	82.1%	12.5%	4.7%	0.6%	1.24
Take a taxi or cab	82.9%	12.7%	3.8%	0.6%	1.22
Special transportation service	93.4%	3.2%	2.4%	0.9%	1.11

There were 83 missing responses.

Ten respondents identified an additional mode of transportation such as the *commuter rail or train*. The complete list of verbatim comments and themes appears in **Appendix E**.

FINDINGS – ADDITIONAL COMMENTS

Respondents were invited to provide additional comments – 74 respondents provided at least one comment. Qualitative thematic analysis extracted five discrete themes related to community services and programs, transportation, housing, taxes, and community infrastructure and retail. See Table 25. The complete list of verbatim comments, themes, and sub-themes appears in **Appendix F**.

Table 25: Additional Comment Themes and Sub-Themes

Community Services and Programs
• <i>Services seniors desire in the community</i>
• <i>Comments about existing community services for seniors</i>
• <i>Need for enhanced communication and education related to services and other areas</i>
• <i>Need for assistance finding and contracting with private services</i>
Transportation
• <i>Need for enhanced transportation options within Needham</i>
• <i>Free or reduced cost ridesharing programs</i>
• <i>Need for transportation to medical appointments</i>
• <i>General lack of transportation options in the area</i>
Housing
• <i>Limited housing options for seniors wishing to downsize</i>
• <i>Lack of affordable housing for seniors</i>
• <i>Limited availability of housing for seniors</i>
• <i>Desired changes to accessory dwelling unit rules</i>
Taxes
• <i>Tax exemptions for seniors</i>
Community Infrastructure and Retail
• <i>Community infrastructure and physical plant recommendations</i>
• <i>Business and retail recommendations</i>

APPENDIX A: DELAYS IN ACCESSING HEALTH CARE – OTHER RESPONSES

Delays in Accessing Healthcare (37 comments)

<i>Delays in Accessing Health Care – Limited availability</i>	
- Appointment limitations at doctor offices. - Availability of care. - Couldn't get appointment. - Dental and eye care have been less available. - Dentist scheduling issues. - Difficult getting doctor's appointments within 6-months. - Difficulties getting an appointment. - Difficulty in getting an appointment. - Doctors were not available. - Getting appointment. - Health care providers too busy or not available mostly due to support staff shortages. - In June, appointments were not able to be booked until January 2023. Unacceptable.	- Limited appointment times for tests / doctor availability. - Long wait times to get doctor appointments. - Long waits. - My doctor is retiring. A new doctor can't see me for 4 months. - My PCP retired and I must wait to see my new one. - Provider not as available. - Provider not available. - Recently moved to state. Having trouble moving my records. - The delay was due to the healthcare provider. - The provider delayed the procedure. - Trying to get appointments has been difficult. - Wait time for appointment was long.
<i>Delays in Accessing Health Care – No provider</i>	
- Lack of available physicians – not taking new patients. - Need new PCP.	- No therapists available. - Physician no longer handling primary patients. Need new one.
<i>Delays in Accessing Health Care – Cost/Coverage</i>	
- Expense. - Insurance issues.	- Lack health coverage such as eyeglasses & dental crowns. - Loss of Medicaid insurance due to spouse's death.
<i>Delays in Accessing Health Care – Competing demands</i>	
- Caring for my terminally ill husband – no time for me to seek health care for myself. - Life circumstances.	- Too busy with work.
<i>Delays in Accessing Health Care – Health Issues</i>	
- Due to shoulder injury, delayed some appointments	- Poor health

APPENDIX B: SOURCES OF TECHNICAL SUPPORT – OTHER RESPONSES

Sources of Technical Support (46 comments)

Sources of Technical Support – Private service/consultant

- | | |
|---|--|
| <ul style="list-style-type: none"> - A private contractor. - Computer consultant in the area. - Computer consultant. - Computer technician. - Consultant. - Have Techie come to my home if there is trouble with my computer. - I have access to an IT person. - IT specialist consultants. - Local computer consultant organization. - Long-time Needham service provider. | <ul style="list-style-type: none"> - My personal computer technician. - Outside private help. - Paid consultant. - Paid technologist. - Pay an expert. - Pay for help if necessary. - Private company. - Professional. - Purchase tech support. - Use technology specialist. |
|---|--|

Sources of Technical Support – Workplace support

- | | |
|---|--|
| <ul style="list-style-type: none"> - At work. - I am still employed so I use my IT people at work. - I'm still working. - IT workplace support. - Office. - Office. | <ul style="list-style-type: none"> - Our IT person at work, remotely during the pandemic. - Through work. - We use a hired support for our business. - Work IT department. - Workplace. |
|---|--|

Sources of Technical Support – Self-support

- | | |
|---|--|
| <ul style="list-style-type: none"> - Can fix things myself. - I am a techie – I do it myself. - I can support myself. - I do it myself. | <ul style="list-style-type: none"> - I figure it out sometimes. - Myself. I'm a software engineer. - Read the documentation. - Self. |
|---|--|

Sources of Technical Support – Community organization

- | | |
|--|--|
| <ul style="list-style-type: none"> - In CCRC residence. - Tech support at North Hill. - The Carroll Center for the Blind in Newton. | <ul style="list-style-type: none"> - The Carroll Center for the Blind. - Wellesley library has classes and appt to discuss tech. - Wellesley library. |
|--|--|

Sources of Technical Support – None

- None. I don't know where to get it or how to describe what I even need.

APPENDIX C: BARRIERS TO PARTICIPATING IN ONLINE ACTIVITIES – OTHER RESPONSES

Barriers to Participating in Online Activities (22 comments)

Barriers to Participating in Online Activities – Health and physical factors

- Age problems and privacy issues.
- Caring for spouse.
- Chronic fatigue syndrome. Too tired.
- Difficult to participate for long periods.
- I am blind and use JAWS reader on my computer and iPhone. Some information is inaccessible and prevents me from participating.
- I'm blind so some technology is inaccessible.
- Less able to participate in life activities due to age.
- Too much screen and sitting time – on Zoom for work all day.

Barriers to Participating in Online Activities – Software and computing challenges

- Difficulty logging on.
- Difficulty logging on.
- I have a computer (gift) – need help to start.
- I have difficulty logging on.
- I sometimes have difficulty logging on.

Barriers to Participating in Online Activities – Scheduling

- Schedule conflicts.
- Sometimes they're at times when my religion keeps me offline – for religious reasons.
- They're often at times/days I can't use internet for religious reasons.
- Too busy – often meetings and Zooms are overlapping, or conflict with my work schedule.

Barriers to Participating in Online Activities – Other comments

- Ability to use the space where the computer is located.
- Costs of online classes and events.
- I miss seeing the people who are participating. I cannot make new friends/acquaintances during such a structured interaction.
- Often these webinars are not communicative. More of a one way.
- Quickly I get bored or the technology on Zoom presenter's end doesn't work.

APPENDIX D: HOME MODIFICATIONS – OTHER RESPONSES

Home Modifications (13 comments)

Home Modifications – Accessibility improvement

- Brought laundry appliances up to the living level.
- Considering attaching an apartment when size of house becomes undesirable.
- Grab bars were installed for my father, and I use them.
- Had rails put in on outside steps.
- Modified primary bath to a walk-in shower.
- Relocated laundry from basement to enlarged bathroom on 1st floor.
- Two handrails for stairs.

Home Modifications – Assistive technology improvements

- I wear a Life Alert button to get help in case of an emergency.
- iWatch/iPhone with Emergency Medical ID.
- Phone with 911 button capability.

Home Modifications – Energy efficiency improvements

- New windows.
- Sunroom.
- Windows.

Barriers to Making Home Modifications (4 comments)

Barriers to Making Home Modifications – Additional comments

- Don't know how or where to start.
- Finding a competent handyman for small household jobs.
- Lack of adult dwelling unit flexibility.
- Pandemic. Contractors were problematic with masks and public safety overall.

APPENDIX E: TRANSPORTATION METHODS – OTHER RESPONSES

Transportation Methods (10 comments)

Transportation Methods – Commuter Rail / Train / Subway

- Commuter rail.
- Commuter rail.
- Commuter rail.
- Commuter rail and subway (D line).
- Commuter rail for trips to Boston.
- Train.
- Train.
- Train.
- Use commuter rail (train).

Transportation Methods – Additional comments

- Private car service.

APPENDIX F: ADDITIONAL COMMENTS

Community Services and Programs (29 comments)

Community Services and Programs – Services seniors desire in the community

- Bring back the program for installation of fire alarms by the fire department.
- Can Needham please support having Pickleball courts for us to use. It is a great community exercise option. I have been using the tennis court that has been taped up for Pickleball at Mills Field in Needham. It has allowed me to meet a great number of residents, allowing for exercise, chit chat with new friends, and just a lot of fun. It is a growing sport in retirement communities.
- I have mobility issues. Would appreciate it if a library return box could be created so that I wouldn't have to get out of the car.
- I wish your services were not directed toward the older who are elderly, nothing seems to be directed at the young-old.
- Lifelong Needham Seniors should get free admission to Rosemary Pool.
- Many seniors need help and financial assistance helping seniors pay bills, utilities, rent, food, transportation, help around the house, appointments, errands, home care, and home cleaning. It's an awful situation growing older, living alone, without financial security and being too embarrassed or at a loss in getting help. Maybe free food gift cards for emergency times when we can't make ends meet (and we're not approved for the food bank... which is an embarrassment to go to anyway!)
- Needham residents are expected to do all their own trash and garbage services. We are required to pay for yellow bags for trash collection and all our own transportation costs. Many folks end up paying for private trash pickup services weekly on top of ever-increasing property taxes.
- Needham's people are the best. Our children have been given much in homes, in religious institutions, in education, in sports, in the library, and in medical facilities. The town volunteer ethic is awesome!
- Provide free services for trash pick-up and disposal (hardship for elderly to take trash to the dump who can't afford to pay someone!). If nothing else, the town should give us free trash bags please!
- The dump nickels and dimes people to throw away items. It should be free.
- Would encourage Parks and Rec to line tennis courts for pickleball/multi-use. I have enjoyed meeting others this way of all ages.

Community Services and Programs – Comments about existing community services for seniors

- Fortunately, the Town has services (especially the Senior Center) that are of great benefit for us.
- I am extremely impressed with the services and support that the senior center and the Community Council offer. They are available and offer a wealth of support and information. I attend the senior center for bridge and other activities and have met many wonderful people there. I also commend the senior center for their extraordinary support and services during the pandemic. I often speak to others about how amazing they are. We are lucky seniors to live in such a supportive and helpful community! A huge thanks to all who help to make this town a wonderful place to live!
- I am grateful for the services being offered by the Center at the Heights as well as the Needham Community Council. All sorts of folks work hard to serve the older population which makes up around 25% of Needham residents and they do an excellent job.
- I hope that the senior center could buy or obtain donation to upgrade the gym.
- I was hoping this survey addressed if our local senior center is meeting the needs of the seniors in their 60's. Most of us feel it is not.
- Making friends in a new community at this age very difficult - I go to CATH and that helps.
- Needham is a good town for seniors. Excellent Senior Center and help if needed.
- The Center does a wonderful job meeting many of our needs; their transportation services have been a godsend!
- The programming offered by the Needham COA Center has been outstanding. Without the Zoom classes I would have been very isolated. I know from numerous friends that the Needham COA programming is the local Gold Standard for Senior programming.
- Though I don't often use services at CATH and Community Council, I really appreciate them and know I'll use them in the future. Thank you!

Community Services and Programs – Need for enhanced communication and education related to community services and other areas

- I am blind, I depend on my ability to do a lot online, but websites and apps need to be accessible for me to navigate and interact with them effectively.
- I would like to see more publicly available information on town government policies and practices, both from local initiatives and state and/or federal mandates. Currently available information is generally not user friendly or concise enough to be (reasonably) easily accessed/understood.
- My husband assists me with internet, technology, zoom, ride share set up. I would benefit from education in all these areas as I do rely heavily on him.
- We need better advertising now that we do not have our own town paper which is a serious loss (letters to the editor, political, religious, town issues, town history, articles about special citizens, deaths, marriages).
- Wish there were better avenues in communication. We only get the Hometown Weekly mailed to us each week. Used to receive Needham Times on front lawn once a week. Miss that communication.

Community Services and Programs – Need for assistance finding and contracting with private services

- Could use a list of qualified handymen that are used to working with seniors. Individuals, not a company.
- It would be great if the town would have a list of reliable contractors for people who need services: painters, lawn services, winter plowing services, electricians, plumbers, construction contractors for small and big projects. These contractors could be vetted and be monitored to be sure they complete work to the satisfaction of the elderly residents.
- We could use help with minor tasks, changing high light bulbs, storm windows, moving Passover dishes from the attic. What a great idea for multi-generational interaction!

Transportation (23 comments)

Transportation – Need for enhanced transportation options within Needham

- Has a town shuttle from the Heights to the Junction between 10am and 2 pm Monday through Friday ever been considered?
- I do not drive so need help getting to town for shopping.
- Living off Charles River Street, having a car is a must – there are no sidewalks, minimal/no shoulder along road, heavy traffic, blind spots, minimal lighting at night. Walking/biking for pleasure is very dangerous. There are no conveniences to walk to, and no public transportation is available.
- Need transportation like MetroWest Ride that includes Seabeds Way, senior and disabled, residents, in its route. This service should be 24/7. Sundays for church and farmers market, town square, and Trader Joe's.
- Public transportation has long been an issue with seniors. It has been discussed many times in focus groups. The new housing office is on Highland Ave. with quite a way to walk from the nearest bus stop – big mistake! They could have moved to Reservoir St. or even downtown Needham.
- Seabeds is not conveniently located. It is nearly two miles out of Needham Center.
- The lonely elderly need help when they live alone, can't get out, can't get to the Senior Center. Some are very lonely, lacking human interaction, medical attention, not eating adequately, and are depressed. The elderly need to be noticed and accounted for. Our religious institutions should track their members and assess their needs and where they can help or use each other to make a unified cooperative front to answer these needs in the best environment possible. Vans to get them there. Van rides to town for anyone would be fabulous. I want my town to be inviting, friendly, accessible, alive, needing me like I want to need it.
- We are very far from town at Seabeds. The complex is down a long hill with a steep incline. We a way to get out more frequently.

Transportation – Free or reduced cost ridesharing programs

- I think we should have ride shares at reduced rates for seniors to visit friends, etc.
- I use the Lyft program from the Needham Community Council. It is dependable and tracked.
- I use the Needham Community Council Lyft program when I need a ride. It has been excellent. They track the ride.
- I use the Needham Community Council Lyft service as it is very dependable, and it is tracked.
- Using Lyft rides courtesy of Commonwealth Care Alliance as part of my privileges. Praise God for CTS.

Transportation – Need for transportation to medical appointments

- I must take my husband to Boston for his medical appointments. Driving into the city and parking is extremely difficult and stressful for me and taxis or Uber is so expensive and technologically challenging. A town sponsored taxi like we had a few years ago would be so appreciated.
- Ride to doctor in Boston. Service was available (I used it twice, and it was great). Apparently, it was abused; please consider having it for elderly people.
- Wish I had transportation to doctor appointments outside Needham into Boston.
- The elderly need rides to appointments.

Transportation – General lack of transportation options in the area

- I am very concerned that when I cannot drive, transportation is very limited.
- There are no local cabs or shuttles in Needham.
- There are no options I know of to get transportation other than Uber or Lyft.

Transportation – Additional comments

- As I get older and driving becomes a problem, I will make more use of transport services of various kinds, as I hope to continue living in my house.
- I am disabled. Often, I don't go anywhere because all I can afford is a \$2 fee for the van provided by the Senior Center.
- I would use transportation for seniors if I couldn't drive.

Housing (18 comments)

Housing – Limited housing options for seniors wishing to downsize

- I would like to be able to downsize and move to a smaller place, perhaps a condo. I don't feel there are many affordable options in Needham to do this with all the tear downs and rebuild of \$2 million dollar homes. This is an issue for the health and wellbeing of seniors. Needham is going to price itself out of the market for older residents. What will this community be like in 10 more years. Wealthy non-community minded people. It's scary to me.
- My main comment is I love Needham but feel there are very few if any options when one decides that one wants to downsize. I watch the number of condos being developed and while they are one level and not very large, they are very expensive. I live near some and they are over a million dollars, which is unbelievable. It would be nice to see more one level condos or apartments that were less expensive.
- Needham lacks affordable housing options for those who would like to downsize. Anxious to promote two-million-dollar McMansions and desirous of only a very high-income population with deep pockets to pay town taxes. It creates a rich monoculture, lacking the richness of diversity and humanity. Needham ends up with very unfriendly policies for seniors and gives a sense that seniors are not valued, should just move out, not wanted.
- The apathy and lack of progress that town leadership has shown toward addressing real affordability means that we can't afford to live here after I retire and downsize in a few years. All I hear is why Needham can't create more 'middle' or truly affordable housing while towns around us are getting it done with more flexible accessory dwelling unit provisions, zoning reforms, and progressive planning. I feel like we are frogs in boiling water.
- We need apartments for seniors who are not low-income and want to downsize but not pay \$2500 per month for a 1-bedroom apartment.

Housing – Lack of affordable housing for seniors

- Housing costs and the increasingly unaffordability of such. I am very worried about where I can afford to go.
- I like living here very much but I could never afford to rent an apartment or buy a house on my own.
- The elderly need financially available housing (modest, clean, well-cared for, walkable, elevators, supervisory help, common rooms, etc.). Current low-income housing is not properly cared for or attractive and welcoming to come home to. I doubt many know where it is hiding.
- Why is the town spending unnecessary money on the town green rather than on more affordable housing.

Housing – Limited availability of housing for seniors

- I have Parkinson's and plan to move to a one level home/condo over the next year – limited availability in Needham.
- I couldn't find any senior complexes to rent - not available or rent too high. Took me three months to finally find an apartment (not senior living).
- I would like to remain in Needham, but there is no housing available.
- Our living arrangement is perfect for me and my husband in our late 70's - a walk-to-everything condominium unit in a large professionally managed building with friendly neighbors, providing the financial stability owning our own unit. There should be more such buildings in Needham.

Housing – Desired changes to accessory dwelling unit rules

- Ease of building an accessory dwelling unit would be most helpful. Providing extra space for caregivers and additional income for seniors on fixed income that may want age gracefully in familiar and comfortable Needham.
- I am particularly interested in having accessory dwelling units available in town. Many seniors could stay here and be relatively independent with this kind of support (and many families would benefit, also).
- The revised code for building an in-law suite was a great step. How about that add-on being available to another who is looking for a living situation to rent and possibly find the human contact needed that one might feel and that has no local family.

Housing – Additional comments

- Needham is unaffordable to those who wish to age in place. Small homes are becoming scarcer. Seniors don't need or want huge, expensive homes.
- The cost of living in Needham has risen substantially. I cannot afford to make repairs to my home. I wish Needham would re-evaluate and find a way to help seniors be able to live out their lives in the town they grew up in and have fond memories of. It seems we are priced out of town which is sad.

Taxes (12 comments)

Taxes – Tax exemptions for seniors

- A reduced real estate tax for seniors might be a nice feature. With constantly increasing taxes and cost of living it might become not affordable.
- As a retired senior, continued increases in local taxes are a major concern and very problematic.
- High real estate taxes.
- If you are interested in helping seniors, I recommend that you speak to those who keep raising our property taxes.
- Needham is not a senior friendly town. Other towns show their honor and respect for the senior populations by giving them a tax break and having them pay only half of their tax with certain conditions and stipulations.
- Reduction of property taxes.
- Taxes. I wish that the town powers would stop competing with neighboring towns. They build a new school...we build a new school. They build a new fire house...we build two new fire houses. They have brick intersections...we have brick intersections.
- Taxes and cost of living in Needham will make it difficult to retire and stay in town.
- The continued increase of local taxes and living expenses (heating, food, medical, services, etc.) make it very difficult for seniors (and those on fixed incomes) to live in Needham.
- There are no property tax breaks offered, particularly for seniors who save the town money by not having children in the school system. Needham has little consideration for the fixed budgets of its seniors. Increased fees are ongoing.
- You could give seniors a real estate tax break so they can stay in their homes. With all the big houses getting built, you should have enough tax money!

Taxes – Additional comments

- The tax bill should indicate where our tax money goes. How much goes to schools, waste management, police, fire, etc.? There is no transparency with town government regarding where our tax money goes. I have lived in Needham for over 50 years and now I have soured because of what I feel in unnecessary spending. I feel Needham is trying to keep up with other. We, older people, have been a big part of this town and now we are being phased out. Start taking care of the older people on fixed incomes.

Community Infrastructure and Retail (10 comments)

Community Infrastructure and Retail – Community infrastructure and physical plant recommendations

- I might go out more often if suitable parking is available at the places I need to attend. Available parking is an issue.
- I walk from home for exercise. My back sometimes acts up, but benches seem rare.
- Instead of destroying the bridge that connected Needham to Newton, this bridge should have become rails to trails connection and beyond for longer walks or bicycling off road.
- It is difficult to get into buildings and doctor's offices. They often have no push button to open automatically when I bring friends for appointments - they use walkers, so it is hard for them.
- Making the town and streets more bike friendly is important.
- More benches to sit on around town.

Community Infrastructure and Retail – Business and retail recommendations

- A town of 30,000 should have competition to select for food shopping.
- I think that the price of groceries in Needham for people living on a fixed income is ridiculous. Need more options.
- Needham should allow the sale of recreational cannabis, discounts at the dispensary and cannabis delivery.
- The elderly need retail shops to answer basic needs. The elderly need restaurants like a diner, ice cream shop to meet and sit with a cup of coffee, breakfast, sandwich, to talk with friends and can afford it. It happens now to some extent as McDonalds. More drug stores, cleaners, etc. to pick-up and deliver (reduced charges). Elderly people move out of town against their own wills because they can't get their needs answered here. But their lives and friends are here.



SURVEY ON HEALTHY AGING IN NEEDHAM

Directions

The Needham Department of Health & Human Services is conducting this survey of Needham residents who are 60 years of age and older to gather their opinions and assess their needs. The results will be used to help program and service planning for Town departments and community-based organizations.

This survey should take approximately 15 minutes to complete.

Completed surveys can be dropped off at the Rosemary Recreation Complex, the Needham Community Council, the Center at the Heights, or at Town Hall with the Clerk or Treasurer.

If you would prefer to mail back the survey, you can place it in an envelope and mail it to:

Lynn Schoeff
Needham Department of Public Health
178 Rosemary Street
Needham, MA 02494

This survey is also available online. To take part in the survey online, just type the following website address into an internet browser such as Google Chrome, Internet Explorer, or Safari. The survey can be accessed both on a computer and on an iPad or other tablet device.

Website Address: <https://survey.alchemer.com/s3/6895076/needham-healthy-aging>



Thank you very much for your time.

These first questions are about you

1. How do you identify your gender? (choose one)

- ☐ Female
- ☐ Male
- ☐ Transgender Female
- ☐ Transgender Male
- ☐ Non-binary or gender non-conforming
- ☐ Some other way
- ☐ Prefer not to answer

2. How do you identify your race or ethnicity?

(choose all that apply)

- ☐ Black or African American
- ☐ Asian
- ☐ Hispanic or Latino(a)
- ☐ Native American or Alaska Native
- ☐ White
- ☐ Native Hawaiian or Pacific Islander
- ☐ Some other way
- ☐ Prefer not to answer

3. What is your age? (age in years): _____

4. How many people, including yourself, live in your household?

(number of people): _____

5. What type of home do you currently live in?

(choose one)

- ☐ Single family home
- ☐ Town home or duplex
- ☐ Apartment
- ☐ Condominium
- ☐ Accessory dwelling unit (attached apartment)
- ☐ Other, please specify below:

6. Which of the following best describes the setting in which you currently live? (choose one)

- ☐ Private residence
- ☐ Affordable housing (Chapter 40B)
- ☐ Needham Housing Authority property
- ☐ Senior housing
- ☐ Long-term care facility
- ☐ Other, please specify below:

7. In general, when compared to most people your age, how would you rate your health? (choose one)

- ☐ Excellent
- ☐ Very Good
- ☐ Good
- ☐ Fair
- ☐ Poor

8. Have you ever provided care for another adult living in your household who needed assistance with everyday tasks? (choose one)

- ☐ Yes, I am currently providing care
- ☐ In the past, but not currently
- ☐ No

9. Please estimate your annual household income before taxes in 2022. (choose one)

- ☐ Less than \$25,000
- ☐ \$25,000 to \$49,999
- ☐ \$50,000 to \$74,999
- ☐ \$75,000 to \$99,999
- ☐ \$100,000 to \$149,999
- ☐ \$150,000 to \$199,999
- ☐ \$200,000 to \$249,999
- ☐ \$250,000 or more

These questions are about social connections

10. How often do you feel isolated or lonely (lacking companionship, feel left out, isolated from others)? (choose one)

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Often

11. In comparison to before COVID-19, how isolated or lonely do you feel now? (choose one)

- ☐ Much less isolated or lonely now
- ☐ A little less isolated or lonely now
- ☐ No change
- ☐ A little more isolated or lonely now
- ☐ Much more isolated or lonely now

12. How connected do you feel to your community?

(choose one)

- ☐ Extremely connected
- ☐ Very connected
- ☐ Somewhat connected
- ☐ Not very connected
- ☐ Not at all connected

13. In comparison to before COVID-19, how connected to your community do you feel now?

(choose one)

- ☐ Much more connected now
- ☐ A little more connected now
- ☐ No change
- ☐ A little less connected now
- ☐ Much less connected now

14. How often do you usually speak with people in the following ways? (choose one per row)

	Daily	Every week	Twice a month	Once a month	Less than once a month	Hardly Ever
a) In person	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
b) Telephone or cell phone	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
c) Video call (Zoom, Facetime)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐

15. In comparison to before COVID-19, how frequently are you speaking with people now? (choose one)

- 1 ☐ I speak with people more than I did before the pandemic
 2 ☐ I speak with people about the same as I did before the pandemic
 3 ☐ I speak with people less than I did before the pandemic

These questions are about food and cost of living

16. Did any of the following things happen to you during the past 12 months? (choose one per row)

	No	Yes
a) You were not able to prepare or cook food because of health problems	1 ☐	2 ☐
b) You had difficulty finding the kind of food that you wanted	1 ☐	2 ☐
c) You felt that you couldn't afford to eat balanced meals	1 ☐	2 ☐
d) You worried that your food would run out before you could get more	1 ☐	2 ☐
e) You had difficulty getting transportation to the grocery store	1 ☐	2 ☐
f) You had difficulty having groceries delivered	1 ☐	2 ☐

17. How worried are you about the cost of living (food, gas, heating oil, electric, housing) and its impact on your financial security this year? (choose one)

- 1 ☐ Not at all worried
 2 ☐ Not very worried
 3 ☐ Somewhat worried
 4 ☐ Very worried
 5 ☐ Extremely worried

These questions are about errands and activities

18. How comfortable are you leaving your home to run errands, go to doctor appointments, get groceries, or participate in social activities? (choose one)

- 1 ☐ Extremely comfortable
 2 ☐ Very comfortable
 3 ☐ Somewhat comfortable
 4 ☐ Not very comfortable
 5 ☐ Not at all comfortable

19. In comparison to before COVID-19, how comfortable are you leaving your home to run errands, attend appointments, or participate in social activities now? (choose one)

- 1 ☐ Much more comfortable now
 2 ☐ A little more comfortable now
 3 ☐ No change
 4 ☐ A little less comfortable now
 5 ☐ Much less comfortable now

20. How often do you currently participate in social groups, classes, recreation, or cultural events in person? (choose one)

- 1 ☐ Daily
 2 ☐ Every week
 3 ☐ Twice a month
 4 ☐ Once a month
 5 ☐ Less than once a month
 6 ☐ Never

21. How often do you currently participate in social groups, classes, recreation, or cultural events online (such as Zoom)? (choose one)

- 1 ☐ Daily
 2 ☐ Every week
 3 ☐ Twice a month
 4 ☐ Once a month
 5 ☐ Less than once a month
 6 ☐ Never

22. During the past 6 months, have you had difficulty accessing health care due to lack of provider availability or long wait times? (choose one)
- 1 ☐ I have not needed health care in the past 6 months
 2 ☐ No
 3 ☐ Yes
23. During the past 6 months, have you delayed seeking health care (appointments, tests, procedures) due to concerns about the COVID-19 pandemic? (choose one)
- 1 ☐ I have not needed health care in the past 6 months
 2 ☐ No
 3 ☐ Yes

24. Which of the following factors, if any, caused you to delay seeking health care during the past 6 months? (choose all that apply)
- 1 ☐ Not applicable – I did not delay seeking health care or did not need care during the past 6 months
 1 ☐ I did not have transportation
 1 ☐ I was worried about exposure to COVID-19
 1 ☐ I did not have anyone to go with me
 1 ☐ Some other reason, please describe below:

These questions are about technology

25. How often do you typically use the internet for things like email, getting information, paying bills, or purchasing? This includes access from home, work, a mobile device, or someplace else. (choose one)
- 1 ☐ Daily
 2 ☐ Every week
 3 ☐ Twice a month
 4 ☐ Once a month
 5 ☐ Less than once a month
 6 ☐ Never go online
26. Do you have internet at home (including internet access through a smartphone)? (choose one)
- 1 ☐ Yes
 2 ☐ No
27. Which of the following factors, if any, prevent you from having internet at home? (choose all that apply)
- 1 ☐ Not applicable – I have internet at home
 1 ☐ I am not interested in having internet at home
 1 ☐ It costs too much money
 1 ☐ I don't have anyone to help me set it up or use it
 1 ☐ Some other reason, please describe below:
28. Do you currently use any of the following types of technology? (choose one)

	Yes	No
a) Smart phone or mobile phone	1 ☐	2 ☐
b) Desktop computer	1 ☐	2 ☐
c) Laptop computer	1 ☐	2 ☐
d) Tablet (such as iPad, Samsung, Fire)	1 ☐	2 ☐
e) Electronic reader (such as Kindle)	1 ☐	2 ☐

29. Do you prefer participating in programs (workshops, classes, cultural events, discussion groups, fitness) in person or online? (choose one)
- 1 ☐ In person
 2 ☐ Online
 3 ☐ I have no preference
30. Do you ever feel like you can't participate in certain activities because they are online? (choose one)
- 1 ☐ No
 2 ☐ Yes
31. Which of the following factors, if any, prevent you from participating in online activities? (choose all that apply)
- 1 ☐ Not applicable – I have no interest in participating in online activities
 1 ☐ None – I am able to participate when I want
 1 ☐ I can't afford a computer or internet
 1 ☐ I don't know how to use the technology
 1 ☐ I don't have a good enough internet connection
 1 ☐ I don't have the right equipment (video camera, microphone)
 1 ☐ Some other reason, please describe below:
32. Where do you get technology support when you need it? (choose all that apply)
- 1 ☐ Online search, chat groups
 1 ☐ A store or service (Best Buy, Apple Store)
 1 ☐ From family or friends
 1 ☐ At the library
 1 ☐ At the Center at the Heights (senior center)
 1 ☐ Community Council
 1 ☐ Other, please describe below:

The next questions are about modifications to your home

33. Have you made any of the following modifications to your home to enable you to stay there as you age? (choose one per row)

	Yes	No	Not Sure
a) A ramp, wider doorways, chairlift, or elevator to allow easier access into or within your home	1 ☐	2 ☐	3 ☐
b) Bathroom modifications such as grab bars, handrails, a higher toilet, or non-slip tiles	1 ☐	2 ☐	3 ☐
c) Added a bedroom, bathroom, and/or kitchen on the first floor	1 ☐	2 ☐	3 ☐
d) Improved lighting	1 ☐	2 ☐	3 ☐
e) Installed a medical emergency response system that notifies others in case of an emergency	1 ☐	2 ☐	3 ☐
f) Added an accessory dwelling unit (an attached apartment)	1 ☐	2 ☐	3 ☐
g) Other, please specify:	1 ☐	2 ☐	3 ☐

34. Have you wanted to make modifications to your home, but were not able to? (choose one)

1 ☐ Yes 2 ☐ No

35. If you were not able to make modifications to your home, what has prevented you from making these changes? (choose one per row)

	Yes	No	Not Sure
a) I don't own the property and am not allowed to make modifications	1 ☐	2 ☐	3 ☐
b) Cost of the modification.....	1 ☐	2 ☐	3 ☐
c) Architecture of the home	1 ☐	2 ☐	3 ☐
d) Building or zoning codes	1 ☐	2 ☐	3 ☐
e) Finding a contractor	1 ☐	2 ☐	3 ☐
f) Other, please specify:	1 ☐	2 ☐	3 ☐

The next questions are about community infrastructure and transportation

36. How often do you need transportation outside Needham for the following? (choose one per row)

	Very Often	Sometimes	Rarely	Never
a) Work.....	1 ☐	2 ☐	3 ☐	4 ☐
b) Non-medical appointments.....	1 ☐	2 ☐	3 ☐	4 ☐
c) Shopping.....	1 ☐	2 ☐	3 ☐	4 ☐
d) Visiting friends or relatives	1 ☐	2 ☐	3 ☐	4 ☐
e) Medical appointments	1 ☐	2 ☐	3 ☐	4 ☐

37. How often do you currently use the following ways to get yourself around Needham for trips like shopping, visiting the doctor, visiting friends, and running errands? (choose one per row)

	Very Often	Sometimes	Rarely	Never
a) Drive yourself.....	1 ☐	2 ☐	3 ☐	4 ☐
b) Have others drive you.....	1 ☐	2 ☐	3 ☐	4 ☐
c) Walk	1 ☐	2 ☐	3 ☐	4 ☐
d) Ride a bike.....	1 ☐	2 ☐	3 ☐	4 ☐
e) Use public bus or shuttle	1 ☐	2 ☐	3 ☐	4 ☐
f) Take a taxi or cab	1 ☐	2 ☐	3 ☐	4 ☐
g) Use ride-sharing service like Uber or Lyft	1 ☐	2 ☐	3 ☐	4 ☐
h) Use a special transportation service, such as one for seniors or persons with disabilities.....	1 ☐	2 ☐	3 ☐	4 ☐
i) Other, please specify:	1 ☐	2 ☐	3 ☐	4 ☐

38. Please share any additional comments on the next page.



NEEDHAM PUBLIC HEALTH DIVISION



Senior Assessment 2022 Focus Group Discussion Guide

Introduction:

Facilitators introduce themselves and thank participants. Then read or paraphrase the following.

Background:

The Needham Department of Health & Human Services is gathering information about older adults and their experiences in Needham. The purpose of this community assessment is to help Town departments and community service organizations develop the right programs and to assess ongoing issues caused by the Covid pandemic.

The last senior assessment was conducted in 2016. The information helped direct program planning, support successful grant applications, and, more concretely, led to the passage of the accessory dwelling unit bylaw.

A piece of this assessment process is speaking with directly with Needham residents to learn your thoughts about Needham as a place to age, about benefits and challenges of living here, and about how the Covid pandemic has affected your daily lives. We are also conducting a survey (we will talk about that later), and interviewing leaders in town.

Themes that emerge from this and other group discussions will be summarized and compiled into a report to be shared with the public.

Group basics:

1. Please share your thoughts, opinions and reflections and ask that you speak with each other rather than to me.
2. There are no wrong answers! You are the experts, and we look forward to learning from you.
3. We want to hear from everyone, so as a facilitator, I may ask for different participant thoughts on a particular topic or question, especially if I haven't heard from you yet.
4. We will be taking notes to most accurately reflect the information you share with us.
5. You can decide to no longer participate at any time.
6. The group discussion is planned to last an hour total.
7. Are there any questions for us before we begin?

Opening questions:

1. Let's go around and introduce ourselves. Please also say something about the features of Needham that make it a good place to live as you age.
2. What problems do you encounter in Needham as an older person?
3. What is missing from Needham that would enhance your health, social participation, and security?

Making a home in Needham:

4. Is your home laid out to be age-friendly? That is, can everything you need (bedroom, bathroom, kitchen, laundry) be on one floor?
5. Have you made any structural changes to make your home easier to live in as you age?

Social connections:

6. How did your social connections change during the pandemic?
7. Have those changes continued?
8. Did you participate in any activities during the pandemic that you would not have otherwise tried?
9. Were you, or people you know, troubled by isolation during the pandemic?

Using technology:

10. Has your use of technology changed since the beginning of the pandemic? If so, how?
11. Were you, or people you know, cut off from activities because of a lack of (or difficulty with) technology?
12. Did you use telehealth during the pandemic?
 - a. What did you think of it?
 - b. Will you continue using telehealth after the pandemic danger is over?

Access to healthy meals:

13. Please talk about your access to healthy meals and healthy ingredients.
 - a. Do you get prepared meals? Do you cook your own meals? Is it easy to get to grocery stores?

Alcohol and other drugs:

14. When you think about alcohol, marijuana, and other drug use (including prescription drugs) among older adults in Needham, what immediately comes to mind? Are there specific things that you are concerned about?
15. What attitudes or behaviors among older adults related to alcohol, marijuana, or other drug use do you think should change?

(Note: Karen would like to know what contributes to older adults' substance use in Needham. If you can finesse that into the discussion, she would appreciate it.)

Thank you all,

As I said at the beginning, we are also conducting a survey that touch on these topics and a few others. It is available in paper form and online. Please take some time to fill out the survey. And please encourage your friends to do so as well.

Copies of the survey are at the Needham Community Council, the Center at the Heights, Rosemary Recreation Center, and Town Hall.

**Assessment of Healthy Aging in Needham
Key Informant Interview List**

Maureen Callahan	District Legislative Aide to Representative Denise Garlick
Marianne Cooley	Chair, Needham Select Board
Edward Cosgrove	Chair, Needham Board of Health; Board Member, Council on Aging
Blair Fetzer	Housing Manager, Needham Housing Authority
Kate Fitzpatrick	Needham Town Manager
Rep. Denise Garlick	Massachusetts State Representative
Tara Gurge	Assistant Director, Needham Public Health Division
Rebecca Hall	Needham Traveling Meals Program
Moe Handel	Needham Exchange Club
Paula Jacobson	Director, YMCA Charles River Branch
Aicha Kelley	Assistant Director, Aging Services Division
Katie King	Needham Assistant Town Manager
Demetri Kyriakis	Assistant Director, Needham Public Library
Rev. Ryan Marshall	Co-chair, Needham Interfaith Clergy Association
Timothy Muir McDonald	Director, Needham Department of Health and Human Services
Jeanne McKnight	Vice Chair, Needham Planning Board
Jessica Moss	Assistant Director, Aging Services Division
Stacey Mulroy	Director, Needham Park and Recreation Department
Sandra Robinson	Director, Needham Community Council
Curtis Rush	Housing Manager, Needham Housing Authority
Nayda Sanchez	Leasing Director, Needham Housing Authority
LaTanya Steele	Director, Needham Aging Services Division
Tiffany Zike	Assistant Director, Needham Public Health Division



NEEDHAM PUBLIC HEALTH DIVISION



Unit: Accreditation Team
Date: July 5, 2023 (for June 2023)
Staff: Cindi Melanson and Lynn Schoeff

Activities and Accomplishments

Activity	Notes
Senior Assessment	• Draft slide deck for presentation
Workforce Development Plan	• Finalizing draft
Readiness Assessment	• Began completing Readiness Assessment Draft • Identified documents for Readiness Assessment
Accreditation Steering Committee	• Agenda / discussion items included the following topics. • Team updates ○ Readiness Assessment Deadline, Sept 17, 2023 ○ Senior Assessment Report ○ Brand Strategy launch with MORE firm ○ Community Health Assessment draft document ○ New draft policy for the deliberation and resolution of ethical issues ○ Strategic planning • Domain Updates • Performance Management self-assessment • Quality improvement projects ○ Food safety excellence program ○ Alcohol compliance check data collection
Brand Strategy Development	• Meetings with MORE Advertising to begin the branding project (June 14 and 28)
Strategic Planning	• Attended and contributed to kick off meeting for strategic planning process (June 27), an accreditation requirement.
Policy review and development	• Finalized protocol for "Ethical Issues: Deliberation and Resolution"



NEEDHAM PUBLIC HEALTH DIVISION



Unit: Traveling Meals Program

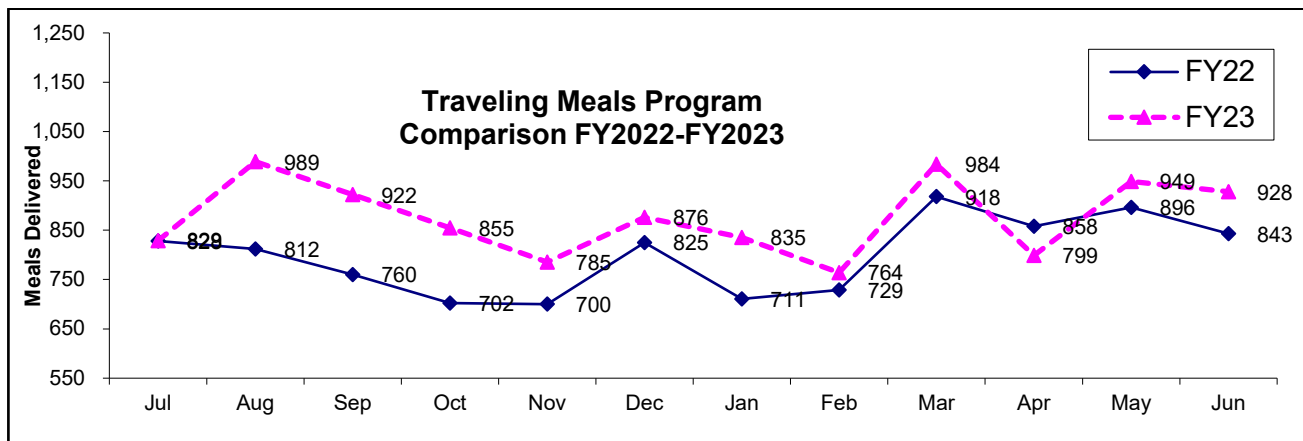
Monthly Report for June 2023

Staff member: **Rebecca Hall, Program Coordinator**

Activities

Activity	Notes
Volunteers delivered meals to homebound Needham residents in need of food.	Meal delivery for month completed by 28 volunteers first 3 weeks and Seasonal drivers last 2 weeks
928 Meals delivered in June 2023 47 Clients at month end 41 Springwell Consumers 6 Private Pay Consumers 3 New Clients (2 Springwell, 1 Private) 3 Canceled Program (3 Springwell)	No 911 calls initiated

Summary overview for the month: **Graph of Meal Deliveries for the month June 2023**





NEEDHAM PUBLIC HEALTH DIVISION



Unit: Emergency Management

Date: June 2023

Staff member: Michael Lethin

Activities and Accomplishments

Activity	Notes
Active Shooter Exercise	The After Action Report for the Joint Active Shooter Tabletop Exercise with Babson College, Olin College, Wellesley College, and the Town of Wellesley has been drafted and sent to MEMA for review before it is distributed.
Shelter Planning	Additional planning meetings, including a site walk through, have been held for the Town's Emergency Shelter Plan.
EOC Training	The Functional Exercise of the Town's Emergency Operations Center was a success and valuable insights will be captured in an After Action Report to improve processes going forward and to inform updates to the Comprehensive EM Plan.
Hazmat Training	Hazmat Awareness training funded by the Hazardous Materials Emergency Preparedness Grant was completed. Over four sessions, approximately 30 staff from Public Works and Public Health participated in the training.



NEEDHAM PUBLIC HEALTH DIVISION



Unit: Emergency Preparedness

Month: June 2023

Staff members: Tiffany Zike and Taleb Abdelrahim

Activities and Accomplishments:

Activity	Notes
Medical Reserve Corps	A. We coordinated with Dr. Ilene Segal, who works through the State of Massachusetts Animal Response Team to provide Shelter for Animals in Disasters in August. B. In June 6 th , 20 people (volunteers & staff members) attended Active Shooter Training by Needham Police Department.
Training	Taleb attended an Emergency Operations Center (WebEOC) Training hosted by MEMA.
Emergency Sheltering Plan	Reviewed the draft Emergency Shelter Plan.
Accreditation	We attended the Steering Committee meeting and continuing work on collecting, reviewing, making changing Domain 2 (Prepare for and response to emergency) documentation.
Other	Wrote up policy about using the Pocketalk Voice Translator.



NEEDHAM PUBLIC HEALTH DIVISION



Unit: Epidemiology

Date: June 2023

Staff member: Julie McCarthy

Activity	Notes
Accreditation	Incorporating feedback into Community Health Assessment; will meet with Accreditation Steering Committee at the beginning of July to brainstorm themes from the data to be detailed in the Community Health Improvement Plan.
Social Media	Instagram: +7.8% followers, +43.4% accounts engaged, +18.4% accounts reached in last 30 days. Facebook post on sunscreen dispensers reached 6,288 people! 684 engagements with post. 6/29/23 Met with Environmental Health team to discuss posts on food safety during summer, information about Food Safety Excellence Program and Nutritionally Needham.
Sunscreen Dispensers	Dispensers installed! 2 at DeFazio Park, 1 at Rosemary Pool, 1 at Greene's Field. Posted about dispensers on social media, write up in News You Need(ham). Ginnie and I will check on the use of the dispensers and maintain them. Included a survey in the News You Need(ham) to gather feedback on locations for next year, survey will be sent again at the end of the season.
Misc.	6/13, 6/20, 6/27: Municipal Public Health Management Training Series (through Metro West Health Foundation) 5/9 & 5/17: Cambridge Biosafety Forum (virtual). Recordings and resources to be made available and can be provided to residents serving as community members on IBCs. 5/8/23: SAPHE Working Group Meeting #3 6/14, 6/28: Brand strategy meetings with MORE Advertising (with Lynn, Cindi) 6/13: MassCALL3 Strategic Planning Meeting #3 6/22: Accreditation Steering Committee Meeting 6/27: Strategic Planning Kick-Off Meeting



Locations:
Rosemary Pool
Greene's Field
DeFazio Park





NEEDHAM PUBLIC HEALTH DIVISION



Unit: Public Health Nursing

Month: June 2023

Staff members: Hanna Burnett and Ginnie Chacon-Lopez

Activities and Accomplishments

Activity	Notes
Communicable Disease investigation	Case notes in summary, below.
Community Outreach	BP clinics at NHA continued. Multiple CPR classes offered to the public, all well attended. Covid vaccines offered with individual appointments in the office, very low uptake. Social media posts continue re: education, health promotion, and prevention. June highlights include Men's Health Month, Impact Melanoma collaboration, and poor air quality alert.
Education	Ginnie: ANA IPC Fundamentals ECHO Series, Active Shooter Training, VFC Compliance/Vaccine Storage and Handling, HIV/AIDS MAPHN Training, LBOH Bi-Weekly Webinars, Xylazine Training, Immunization Updates: Epidemiology of Vaccine-Preventable Diseases in MA, "The Greatest LGBTQ+ Health Issue of All Time: Commercial Tobacco" training, MHOA Webinar: Accreditation Overview, ICS for Public Health Training, HazMat Training, Building Effective and Sustainable Coalitions with CHTI, New Online Injury Reporting Form training, Vaccine Refresher! Preventing Administration Errors Hanna: VFC training (MA DPH), An update on HIV/AIDS and HIV prevention, Treatment, and Access (MAPHN SE), Key Steps in Enteric Disease Case Investigation (MA DPH), Prevent Cancer Dialogue, Summit 2 (Prevent Cancer Foundation), Vaccine Refresher! Preventing Vaccine Administration Errors (CDC)
DVAC	"DVAC Conversation" for the public library staff was very well received. Next one is scheduled @ NHA 7/18 and 8/22. Cable spot planning for October airing date is ongoing with weekly meetings.
Other	Ginnie: EOC Functional Exercise, 4AB PHEP Equity Workshop, Opioid Task Force meeting, Hanna / Ginnie: Hosted three international nursing students (Chile, Switzerland) for their clinical rotation.



NEEDHAM PUBLIC HEALTH DIVISION



Notes:

- COVID cluster at a local hospital all in the same unit. IP reached out to MDPH and were following their recommendations, including a week's worth of negative testing for the unit. No further updates from them.
- Licensed 8 camps, with 3 more to follow later in camp season.
- 4 Impact Melanoma sunscreen dispensers were installed at DeFazio, Greene's, and the pool.

Potential Food-Borne Illnesses	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2023	2022	2021
Amebiasis													0	0	<5
Calicivirus/Norovirus	<5	<5						<5	<5				5	<5	<5
Campylobacteriosis	<5	<5		<5			<5					<5	9	6	15
Cryptosporidiosis													0	<5	<5
Enterovirus													0	0	0
Giardiasis										<5			<5	0	0
Listeriosis													0	<5	0
Salmonellosis	<5	<5		<5			<5				<5		5	<5	<5
Shigellosis													0	<5	<5
Vibrio spp			<5										<5	<5	0
Arbovirus	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2023	2022	2021
Arbovirus (other)													0	0	0
Babesiosis	<5												<5	<5	5
Borrelia miyamotoi													0	<5	0
HGA/Anaplasmosis				<5		<5						<5	<5	<5	<5
Lyme Disease Suspected	6	10	7	5	<5	<5	<5	<5	<5		<5	9	58	N/A	N/A
Lyme Disease Probable	<5	<5		<5	<5	<5		<5	<5	<5	<5	<5	19	51	38
West Nile Infection													0	0	0
Other Communicable Illnesses	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2023	2022	2021
Group A streptococcus													0	0	0
Group B streptococcus	<5												<5	<5	<5
Haemophilus influenzae													0	<5	<5
Hepatitis A													0	0	0
Hepatitis B Confirmed/Probable				<5	<5						<5		<5	9	6
Hepatitis B Contact			<5				<5						<5	0	<5
Hepatitis C Confirmed													0	0	<5
Hepatitis C Probable		0		0				<5	<5	<5			<5	<5	<5
Influenza		<5		<5	22	133	25	6	<5	<5	<5	<5	193	51	<5
Legionellosis							<5						<5	<5	0
Mumps													0	0	0
Novel Coronavirus Confirmed	169	117	107	102	76	154	105	63	35	16	25	11	980	4153	1416
Novel Coronavirus Probable	23	8	14	<5	23	20	33	34	21	<5	5		188	484	118
Pertussis (Bordetella spp.)								<5					<5	0	0
Streptococcus pneumoniae													0	<5	0



NEEDHAM PUBLIC HEALTH DIVISION



TB Disease													0	0	0
Latent TB Infection (Confirmed)	<5	<5		<5	<5	<5	<5	<5	7	<5	<5	6	31	24	21
Latent TB Infection (Suspected)	<5			<5	<5	<5	<5	<5	<5	<5			14	10	5
Varicella	<5				<5								<5	<5	<5
Other				<5	<5						<5	<5	<5	-	-
Totals	211	146	130	121	134	318	174	115	73	27	42	35	1526	4819	1645
Reported Cases later Revoked		1		2			3		3			1			

Immunizations Injections	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2023	2022	2021
B12	1	1						1					3	14	13
Influenza			262	235	219			1			2		719	812	1225
TDap											1		1	3	0
Covid-19	5		167	82	181					2	21	3	461	3792	6963
VFC													0	4	0
Other													0	0	0
Total	6	1	429	317	400	0	0	2	0	2	24	2	1183	4625	8201

Animal-to-Human Bites	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2023	2022	2021
Dog										2	1		3	4	8
Cat													0	0	1
Bat													0	1	7
Skunk													0	0	0
Raccoon													0	0	1
Other													0	0	2
Total Bites	0	0	0	0	0	0	0	0	0	2	1	0	3	5	18

Assistance Programs	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2023	2022	2021
Food Pantry					2	1		1					4	0	0
Friends													0	0	0
Gift of Warmth	5	5	9	7	4	3	4	3	5	2	4	0	51	23	-
GoW Amount	2120	1900	3559	1156	1576	1255	2292	1046	2705	1862	6450	0	25921	13141	16956
Parks & Rec													0	0	1
Self Help				1			2	1	2				6	1	2

Education	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	2023	2022	2021
CPR Education			~75 @Harvest		4	15	25	9	14	14	20	23	197	53	



NEEDHAM PUBLIC HEALTH DIVISION



			Fair												
Matter of Balance Graduates							9	11			14		34	10	
Narcan			2			1	4	6	2	5	3	2	25		0

Donations:	0
Giftcards Distributed:	0



Needham Public Health Division

June 2023



Unit: Shared Services Grants – Public Health Excellence and Contact Tracing

Date: 7/14/2023

Staff members: Diana Acosta, Roland Abuntori, Michaela Bucca

Activities and Accomplishments

Activity	Notes
Environmental Health Work and Training	Roland Abuntori continues to assist Needham with various inspections. He completed: • Starbucks food establishment inspection • Starbucks food establishment reinspection • Review/webinar of new housing code regulations • Domino's Pizza food establishment inspection • Town House of pizza food establishment inspection • Micro market at the exchange food establishment inspection • Gyro and Kebab House food establishment inspection • Abbott's frozen custard food establishment inspection • Hearth Pizzeria food establishment inspection • Training review: Service animals in public settings • North Hill Bistro food establishment inspection • North Hill main kitchen food establishment inspection • North hill central kitchen food establishment inspection • North hill bakery and café food establishment inspection • North hill necessities store food establishment inspection Thaleia Stampoulidou-Rocha is returning to assist with food inspections in the region.
Shared Services Work	Diana is still finalizing the process of obtaining licenses for FoodCodePro, HousingCodePro, PoolCodePro, and R360 for the Charles River Health District. Each municipality will have access to these inspectional programs while the regional inspectors will have access to a regional license where they can enter inspections for any municipality in our Shared Services Agreement. Dover and Needham have submitted their paperwork for the licensing; Sherborn and Medfield are still pending. The MOU has been signed by Needham and Sherborn. Still waiting for signatures from Medfield and Dover. Dover is awaiting a new Town Administrator to finalize their signatures. An invitation to the first Advisory Group meeting will be sent out in July.
Contact Tracing	Michaela Bucca continued contact tracing for Medfield and Dover. Her last day was June 30, 2023.



NEEDHAM PUBLIC HEALTH DIVISION



Unit: Substance Use Prevention MassCALL3 grant Dedham- Needham- Walpole- Westwood

Date: June 2023

Staff members: Carol Read, M.Ed., CAGS, CPS & Lydia Cunningham, MPH, CHES®

Activities and Accomplishments- Meetings and trainings attended through virtual platforms

TEAMS- Zoom- FaceTime unless otherwise noted.

Activity	Notes
MassCALL3 capacity building – Walpole and Needham - 6/1 Amanda Decker, Bright Solutions, LLC	Review and discussion: MassCALL3 strategic planning sessions 1-3, SAPC process, Walpole community coalition capacity building plan goals (qualitative data collection), staff time in Walpole, Needham SPAN strategic planning meeting
Lisa McDonough, Town Accountant - 6/2, 6/12, 6/22, 6/26	MassCALL3 EIM reimbursement, March-May monthly invoice submissions, end of fiscal year budget review and amendment
Boston University- Promoting Mental Health among Children and Youth- 5/5 U.S. Senator Edward Markey, U.S. Surgeon General Vivek H. Murthy	Presentation: Addressing the Youth Mental Health Crisis, opening remarks from Boston University SPH Dean Sandro Galea, increased mental health concerns among youth, impact of social media on mental health, data sharing, recommendations
MassCALL3 Strategic Planning, Prevention Solutions @ EDC- 6/5, 6/8, 6/12, 6/13 Jessica Goldberg, MPH, Consultant	Discussion: strategic planning meeting preparation, decisions about data to be displayed at meetings, data required for strategic planning framework completion for BSAS grant requirement.
Ben Spooner, CPS, Center for Strategic Prevention Support (CSPS) – 6/5, 6/8, 6/13 MassCALL3 Technical Assistance (TA)	Review and discussion: strategic planning feedback, strategic planning meeting preparation, second meeting data collection review, input on social media promotion
Yelling Mule Digital Media Advertising- 6/6, 6/13, 6/22, 6/27 James Shiner, CEO & Founder, Katelyn Shannon, Marketing Account Director	Discussion: updates on engagement with social media advertisements, planning to increase engagement, content ideas, overview of processes related to posting and monitoring digital ads
Education Development Center, Shari Kessel-Schneider- 6/6	Discussion: MetroWest Adolescent Health Survey- optional questions, timing, connection with Walpole and Westwood leadership, collaboration with Walpole and Westwood health directors, confirmation of FY24 and FY25 DPH BSAS funding
Dedham Organization for Substance Awareness (DOSA)- 6/6 Kristina King, Program Director Next meeting: September 12	Agenda: welcome/introductions, upcoming events, questions and concerns, honoring Michael Butler for his contributions, Youth Connect program, overview of Action Plan for fall, summary comments
Bright Solutions & Walpole- 6/8, 6/14, 6/22	Discussion: Walpole capacity building and data collection plans, coalition meeting preparation, MassCALL3 updates, Walpole poster creation
Needham Board of Health – 6/9	Agenda: welcome and public comment period, review of minutes, Board of Health fee schedule, shared services memorandum of understanding,



NEEDHAM PUBLIC HEALTH DIVISION



Tim McDonald, Director Health & Human Services, Tara Gurge and Tiffany Zike, Assistant Public Health Directors Next meeting: July 14, 2023	Select Board FY24 and FY25 goals, Center at the Heights space study and kitchen plans, staff reports, brief updates: alcohol compliance, senior assessment, public health five-year strategic plan, housing updates, other items, adjournment
MassCALL3 Regional Strategic Planning Meeting- 6/13 Jessica Goldberg, Prevention Solutions @ EDC, Ben Spooner, CSPS Technical Assistance	Session 3 of 3: Introductions, reflection on discussion from 5/30 meeting, review of selected risk and protective factors, review of strategy selection criteria, break out group discussion and prioritization of strategies for action plan
Health Links- Antiracism 2023: Environmental Justice and the Workplace- 6/14 David Shapiro, Senior Manager Programs and Partnerships, Center for Health, Work, & Environment	Agenda: Keynote- origins of the movement, research, redlining and lasting impacts, environmental justice overview, environmental justice in the workplace, Panel featuring Christy Angerhofer, Health Equity in Action Lab, University of Colorado, and Robert Franklin, Diversity, Health Equity & Inclusion, Children's Hospital Colorado: environmental microaggressions
Needham Public Health Division (NPHD) Staff Meeting- 6/20 Timothy McDonald, Director, Health and Human Services, Assistant Public Health Directors: Tara Gurge, Tiffany Zike	Agenda: introductions, demonstration of PocketTalk, staff updates, discuss Board of Health goals, staff and cultural appreciation committee, reminders/new methods, other items
Substance Prevention Alliance of Needham (SPAN) -6/27 Amanda Decker, Bright Solutions, LLC	Strategic Planning Meeting 2 of 4- Agenda: welcome and introductions, key findings from Session 1, group survey, action team discussion, wrap up and next steps
Community Member Interviews- 6/27, 6/28, 6/29	Interview: Needham author, volunteer, and parent regarding perception of youth substance use in Needham and surrounding communities. Conducted following MassCALL3 interview guide.
Office of Local and Regional Health (OLRH) Local Boards of Health Webinar 6/27 Kerry Wagner, Steven Hughes, Erica Piedade, Michelle Surdyk, Tina Giancola	Agenda: camp reporting, accident and injury form submission, record keeping, Q & A, newsletter update, registration for coming webinars
Walpole Coalition for Alcohol and Drug Awareness- 6/27 Melissa Ranieri, Health Director, Amanda Decker, Bright Solutions, LLC	Agenda: brief updates from sectors, summer reading (CADCA resources), data collection, structure of coalition in the fall, building capacity, sector recruitment, DFC training, next steps
Building Effective and Sustainable Coalitions- Community Health Training Institute (CHTI)- 6/28 Tamika Francis, Senior Manager, Community Engagement, Tonayo Crow, Program Associate	Agenda: welcome and introductions, the why?, tools for recruitment and engagement, challenges and exploring solutions, close
Prioritizing Intervening Variables, Selecting Strategies, and Developing a Logic Model (BSAS)- 6/29	Agenda: Provide an overview of intervening variables, and explore some sample prioritization criteria and decision-making processes, Describe



NEEDHAM PUBLIC HEALTH DIVISION



Scott Formica, PhD, Senior Research Scientist, Social Science Research & Evaluation, Inc.

potential prevention strategies and selection criteria, Explore the components of a community-level logic model, including development tips

Holiday: (1) June 19, Juneteenth

Needham Public Health Division, staff: May 2023 Monthly Report – All activities, programs, trainings and compliance requirements including programmatic – operational and all reporting requirements.

DRAFT



NEEDHAM **PUBLIC HEALTH DIVISION**



Unit: Substance Use Prevention

Date: June 2023

Staff: Karen Shannon, Karen Mullen, Monica De Winter, Angi MacDonnell

Activities and Accomplishments

Activity	Notes
SPAN Projects/Events	• SPAN Spring Coalition meeting: on June 8 SPAN hosted an in-person meeting to celebrate coalition accomplishments and recognize volunteers. • SPAN Strategic Planning: Amanda Decker of Bright Solutions facilitated two meetings in June to continue SPAN's strategic planning process: June 21 – 5 SALSA students participated in a focus-group- style strategic planning session. June 27 – 17 people attended strategic planning session #2 via Zoom, including 10 coalition members and 7 prevention staff from Needham Public Health. Sessions three and four are scheduled for July and August. • SPAN film, an educational film to raise awareness of SPAN, substance use prevention and the resources available to the community. Boston Filmworks interviewed SPAN members and community leaders for the film. Final production is anticipated in June. • SPAN Newsletter was created and emailed to the SPAN distribution list. • Needham Overdose Awareness Day vigil: Needham's second observance of International Overdose Awareness Day is scheduled for Thursday, August 31 at Memorial Park in Needham. The Becca Schmill Foundation is the planning leader with assistance by community partners, including the Public Health Division. • Prevention Team staff attended the third strategic planning session for Prevention Partners on June 13 hosted by MassCall3 grant coordinators Carol Read and Lydia Cunningham.
STOP Act grant	SAMHSA grant: STOPing Underage Access and Use of Alcohol: Codifying Youth, Parent and Retailer Education and Compliance in Needham, MA: TIPS training: CORRECTION to attendance: the May monthly status report mis-reported the attendance breakdown for the May in-person TIPS training. The total attendance was 27 (24 staff from Needham and 3 staff from Dedham)



NEEDHAM PUBLIC HEALTH DIVISION



	New Prevention staff: One June 6, Vanessa Wronski joined our department as the new Project Coordinator position under the STOP Act Grant.
SALSA	In June, a total of 13 Youth Advocates contributed 33 hours of service in Needham. Of note: - The Metro West Health Foundation awarded SALSA a \$10,000 grant for a youth-led project. Three SALSA students assisted in writing the grant application to request funds to plan & launch a middle school wellness club, similar to the NHS SALSA model. They will recruit and hire a club advisor over the summer and begin planning for the new peer- to- peer advocacy club at Pollard MS that will emphasize mental health. - On June 21, five NHS SALSA members participated in a strategic planning meeting with SPAN as part of the coalition's strategic planning process. - On June 8, four SALSA members participated in the NHS Club Fair for rising 9th graders to recruit new members. 60 new members were recruited SALSA for fall, 2023. - SALSA Highlights of 2022-23 school year included 122 individual SALSA students contributing a record 1,661 hours of service in the community! This compares to 93 students contributing 1447 hours of service during the 2021-22 school year. This year, SALSA leaders planned events and activities heavily weighted during the fall to get more members engaged early. This strategy was successful as this resulted in a 43% increase in member engagement over the previous year.
MetroWest Adolescent Health Survey 2023 - Optional Questions	On June 13 Karen S. and Tiffany Zike attended a meeting hosted by Denise Domnarski, Director of Wellness for the Needham Public Schools (NPS) to discuss the optional questions for the 2023 administration of the MetroWest Adolescent Health Survey (MWAHS). Susannah Hann and Mary Lammi of the NPS were also in attendance. The discussion resulted in a list of 15 questions which were submitted to EDC to request for inclusion in the Needham MWAHS for middle and high schools. The list included questions that are required by the SAMHSA STOP Act Grant and other substance use-related questions that the Needham Public Health Division uses for prevention grants and coalition work.
Parent Al-anon group	Meetings held every Monday evening. Attendance remains steady averaging 6-14 people each week. Hometown Weekly continues free publishing of meeting announcements in Needham edition.
Training/Education	Promoting Mental Health Among Children and Youth, BUSPH, 6/5, Karen M. Active shooter training, MRC, 6/6, Karen S. Regaining DEI Momentum, Charles River Chamber of Commerce, 6/7, Karen S., Monica Using ACE Data to Impact Substance Misuse Prevention PTTC, 6/8, Angi



NEEDHAM PUBLIC HEALTH DIVISION



	Aging with Dignity Conference by BSAS, 6/13, Monica and Karen M. Navigating Local Policy to Advance Community Change, HRIA, 6/14, Karen S., Monica, Vanessa Substance Use and HIV, PTTC, 6/20, Angi Supervision of Recovery Coaches, BSAS, 6/20 & 6/22, 12 hr training, Karen S. How COVID Changed Alcohol Policy, PTTC, 6/21, Angi Demystifying Alcohol Policy Strategies: Planning and Implementation, 6/29, Angi Building Effective and Sustainable Coalitions, HRIA, 6/28, Karen S., Vanessa, Monica Intersection of Substance Misuse and Suicide Prevention, PTTC, 6/29, Vanessa
Meetings	Needham Inclusion meeting, Rachel Glisper, DEI consultant, 6/8, Karen S. SALSA booth at NHS Club Fair, 6/8, Karen S. chaperoned MetroWest Adol. Health Survey Optional Questions mtg w/Need. Public Schools, 6/13, Denise D., S. Hann, M. Lammi, Tiffany, Karen S. Prevention Partners Strategic Planning meeting #3, 6/13, several staff attended NPHD Staff Meeting, 6/13, Monica, Vanessa, Karen M., Angi International Overdose Awareness Day mtg, 6/13, Karen S. attended SAMHSA monthly STOP Act grant call with Jackie Beale, Project Officer, 6/15, Karen S., Monica, and Vanessa attended Jackie Pucillo, Summer Intern, introductory meetings, 6/21 & 6/22, Karen S., Angi, Vanessa Amanda Decker of Bright Solutions strategic planning consultation meetings, 6/8, 6/14, 6/21, 6/26 SAMHSA New England Regional Prevention Stakeholder Quarterly Call, 6/28, Monica attended Norfolk County District Attorney Coalition Leaders meeting, 6/28, Karen S. attended. Prevention Team meetings, 6/1, 6/7, 6/27

Summary for Month of June 2023: Focus this month included the SPAN Spring Coalition meeting and strategic planning work with Amanda Decker of Bright Solutions, the arrival and onboarding of Vanessa Wronski, the new Project Coordinator for the STOP Act Grant, onboarding for summer intern, Jackie Pucillo, and final edits to the SPAN film.



Needham Public Health Division



June 2023

Assist. Health Director - Tara Gurge
Full-time Health Agent – Sainath Palani
Part-time Health Agent – Monica Pancare
Food Regulatory Program Analyst Intern – Ecom Lu
Summer Intern – Madison Poisson

Unit: Environmental Health

Date: July 14, 2023

Staff members: Tara Gurge, Sainath Palani, Monica Pancare, Ecom Lu and Madison Poisson

Activities and Accomplishments

Activity	Notes
Environmental team staff updates	Madison Poisson, MA DPH summer intern, started with us on Monday, June 5 th . She will be working with us until mid-end of August. She will work on some environmental health projects, including the audits of the FDA Standards. She will also be assisting Sai in conducting inspections at the weekly Farmers Market and will also help us promote our Food Safety Excellence Program with Ecom Lu. Social media posts will also be developed on a variety of environmental health and safety topics.
Staff Conferences	Tara and Monica Pancare attended the annual Association of Food and Drug Officials (AFDO) educational food safety conference in Norfolk, VA, from June 11 – 14 th .
Food Safety Excellence Program	Ecom Lu has been drafting educational brochures to be distributed to the public and our food establishment permit holders. He will be working with Madison on that project, and they will both work with Needham Cable in helping us promote our Food Safety Excellence Program, focusing on the Food Code Enforcement Policy and our Food Establishment Grading initiative.
Nutritionally Needham Healthy Eating Program	Ecom has been busy working with our permitted food establishments in gaining feedback from them and has successfully initiated our next healthy eating promotion event, Nutritionally Needham, to take place this coming fall, throughout the entire month of October. We are excited to bring this healthy eating event back to Needham.
Seasonal permit renewals	Worked on reviewing online permit applications for our Animal permits and the Sira Naturals Medical Marijuana MTC permit. Inspections were conducted at both the Sira Naturals grow and food processing facility in Milford, MA and also at the retail facility in Needham. Seasonal Needham Farmers Market food vendor online permits were issued.
Needham Farmers Market	Sai and Madison started conducting weekly inspections of the food vendors at the weekly Farmers Market which started on Sunday, June 11 th at Greene's Field. Inspections will continue until the conclusion of the market, on October 29 th .
Site visit conducted at Needham's Recycling and Transfer Station (RTS)	Sai, Madison and Tara met with Matthew DeMarrais, Superintendent of the Recycling and Solid Waste Division, along with his staff, for a tour of the facility. We will aim to conduct these tours on an annual basis to remain in the loop on the ongoing activities and updates with this well-run facility.

Other Public Health Division activities this month: (See report below.)

Activities

Activity	Notes
Demo Reviews/ Approvals	7 - Demolition signoffs: - #27 Carol Rd. - #14 Winslow Rd. - #835 Webster St. - #166 Elmwood Rd. - #246 Forest St. - #62 Brewster Dr. - #56 Country Way
Disposal of Sharps Permits	0 – Disposal of Sharps Permits issued.
Septage/Grease Waste Hauler Permits Issued	0 – Septage/Grease Waste Hauler Permit Issued.
Trash/Recycling Waste Hauler Permits issued	3 - Trash and Recycling Waste Hauler Permits issued to: - John Timmerman - Dalton Disposal - Save That Stuff
Medical Waste Hauler Permit Issued	0 – Medical Waste Hauler Permits Issued.
Food - Plan reviews/Follow- ups/Pre-operation inspections	5 – Food Permit Plan Reviews/Follow-ups conducted for: - Carter Memorial Methodist Church (Bread of Life Program) – Pre-operation inspection still pending. Scheduled to be conducted in the next week. Found a licensed plumber to install new grease trap by dish machine. Will call us once installed, to conduct a pre-operation inspection. (Still pending.) Working with Building Dept. to have their licensed plumber apply for proper permits for the pending grease trap installation. UPDATE: Applicant is looking to go back to the initial food distribution model and conduct limited food prep on site due to issues with not having a grease trap, and work with already permitted food establishments and having these food items donated. This program would act as a distribution site only if this new plan was put into place. (Still pending.) - Rainbow ADHC of Needham Riverside, LLC (185 2nd Ave.) - This is the old Zdorovie site. A new food establishment will be moving into that space. Received some initial plan review items. UPDATE: Conducted final inspection, should be able to be permitted soon. - Rice Barn (UPDATE): Applicant has proposed an acceptable location for a mop sink. They will need to work with his licensed professionals to install this and address outstanding issues with building department. - Kids and Company (53 4th Ave): Issue arose and may need to totally change their proposal. - Briarwood – New exterior grease interceptor is in the process of being installed. Contractor is currently working with reps with the town Water and Sewer and Engineering Divisions in meeting their installation requirements. Health will ensure that this external grease interceptor, once installed, is put on a routine cleaning/service schedule, which will be verified during our routine inspections.
Food – Temporary Food Event Permits issued	2 – Temporary Food event online permit application reviews and permits issued to: - Mitchell PTC Event - Sweet Pete Ice Cream at Elliot PTC Event

Farmers Market Food Vendor online permit reviews/ Permits issued	1 - Farmers Market Food Vendor permit application reviews/Permits issued for: - Mei Mei Dumplings
Food Complaint/Follow-up	1/1 – Food Complaint received: - <u>Mighty Subs (1/1)</u> - Illness Complaint received through state at end of June but establishment closed for extended period. Reached out to owner and a follow up inspection/investigation will be performed in late July.
Housing Complaints/Follow-ups	2/3 - New Housing Complaints/Follow-ups conducted at: – <u>House near Newton line (near Reservoir St.) (0/1)</u> - Tara and Sai met with owner, along with reps. from Town Manager’s office, Building Dept. and Fire Dept., to conduct a follow-up exterior inspection on 5/31. Town Manager issued a letter to the owner which gave a time frame of cleaning up and removing all the unused items located in the front, side and back yards of the property on or before June 30th. Owner agreed to work with us in removing the items. Sai and Tara will meet with the owner again in one week to check on progress made. <u>UPDATE:</u> Sai visited the site with new Building Commissioner who has proposed a new strategy to move towards compliance. Process will be long and issues will likely return if compliance does get reached. – <u>Hassenfus Cir. (1/1)</u> - Sai was in contact with occupant for about a week and set up housing inspection with occupant after evidence was presented. Housing inspection using new housing code was performed with representatives from the management company and the owner’s independent contractor. Sai sent out orders to correct to the responsible party. <u>UPDATE: Occupant</u> has been reluctant to provide consistent access and reinspection is scheduled for next week. A one-month extension may be granted. – <u>Linden St. (Housing Authority) (1/1)</u> - Complaint was made about a broken stove. An inspection was performed to verify it and housing authority had work orders in and promised it would be fixed in early July. Appears housing authority said stove cannot be fixed. Following up with housing authority.
Housing Pre-occupancy inspection	0 – Housing pre-occupancy inspection conducted.

Nuisance complaints/Follow-ups	(8/11) – New Nuisance Complaints/Follow-ups: - <u>Petco (0/1)</u> – Received an online anonymous concern about increase of pests inside the store. Tara spoke to the Senior Manager of Environmental, Safety and Health Compliance. The store has increased their pest control routine visits up to multiple times per week in order to get on top of this ongoing pest concern. A deep cleaning will also be scheduled for the store. Door sweeps are also on order. Copies of the pest control reports will be submitted, until activity subsides. Follow-up inspection to be conducted to verify improvement. UPDATE: In person follow-up will be performed in July to get a live update. - <u>Complex (1/1)</u>: Sai followed up on pest issue. Bait boxes were set up across and there was evidence of burrows. Sai met with maintenance staff of housing authority and received an invoice for pest services. Sai is following up with this issue. UPDATE: Problem areas were cleaned and monthly treatment is continuing. Following up with the maintenance. - <u>Webster Green (0/1)</u> - Sai followed up with management on pest complaints and smoking by the building. UPDATE: Leasing violation was sent to occupant, however they are using medical marijuana complicating things. Follow up will be performed in July and exploring options to try to address this. - <u>Chambers St. (NHA) (0/1)</u> - Resident reports that neighbor is smoking in unit, and smoke is migrating into her unit and into common area hallway and causing a public health nuisance concern. Tara reached out to Exec. Director of NHA to get the latest updates on NHA plan to address this concern. Also requested that a joint inspection be conducted with Health staff and NHA property manager. UPDATE: Cheryl Gosmon, NHA Executive Director, was able to verify the complaint with her staff and sent a letter to the occupant and copied the Public Health Division, re: the concern. - <u>Mellen St. (1/1)</u> - Resident was concerned about fire hazard in backyard due to piles of dried bamboo and piles of wood. Follow up- Attempted to reach out to homeowner and notified fire department and building department about concerns. - <u>Autobody Shop by Echo Bridge (1/1)</u> - Anonymous complaint was made to MassDEP who contacted our office about odors/vapors. An investigation has started and information about this concern has started to be collected. - <u>Parish Rd. (1/1)</u> - Homeowner was keeping chickens without a permit. Follow-up investigation conducted and it appears that chickens have been removed. - <u>Pickering St. (1/1)</u> - Pest issue on their property, likely originating from neighboring Business. Being investigated and handled. - <u>Wingate Residence (1/1)</u> - Gas odor investigated, nothing observed. Some repairs are scheduled. - <u>Chapel St. Parking Lot/Tracks by Highland Ave. (1/1)</u>- Possible active pest burrows observed. Areas are coordinated to be treated in the month of July. Working with a MBTA/Keolis rep and Town and surrounding food establishment pest control companies to develop a plan of action. - <u>Area off Dedham Ave./DeFazio Field (1/1)</u> - Complaint received re: a large catering container of open chicken and noodles placed in the woods right off the street near DeFazio Field. Tara witnessed and worked with reps from the Town RTS to dispose of the food waste properly, as not to attract pests/wildlife to the area.
Outdoor Seasonal Pool permit reviews/Permits issued	2 - Outdoor seasonal pool permit application reviews/Permits issued: - <u>#178 Rosemary St.</u> - Permits issued for lap and family pools.
Planning Board Special Permit reviews	0 – Planning Board reviews conducted.

Septic Certificate of Compliance (COC)	0 – Septic Certificate of Compliance final sign-offs issued.
Septic – Construction permits issued	0 – Septic Construction Permits issued.
Septic Installation inspections	8 – Septic installation inspections conducted. - #40 White Pine (4)- System Completed. - #61 Crestview (4)- System Completed.
Septic Installer Exams/Permits Issued	3 - Septic System Installer Exams and Permits issued. - Nichols Excavating - Scott Septic - J Derenzo Properties
Septic Addition/Reno. to a Home on a Septic review	1 – Addition/Reno. to a Home on a Septic review conducted for: - #165 Brookside Rd. - Comment letter sent.
Septic Plan Reviews/Approvals issued	0 – Septic Plan reviews conducted.
Septic – Soil/Perc Test	1 – Septic Soil/Perc Test conducted at: - #211 Stratford Rd.
Septic Trench permits issued	2 – Septic Trench permits issued for: - #40 White Pine Rd. - #211 Stratford Rd.
Septic – Abandonment Forms received	1 – Septic abandonment/connection to sewer forms received for: - #61 Crestview Rd.
Sira Naturals Plan Review/Permit issued	1 – Medical Marijuana MTC Permit Plan Review and permit issued: - Sira Naturals – Permit renewed and inspections performed.
Tobacco Inspection conducted/Permit Issued	0 – Inspection Conducted and Tobacco permit issued to:
Well Permit online plan reviews and Approval to Drill letters	0 – Well permit online plan reviews and approval to drill letters issued.
Zoning Board of Appeals plan review	1 – Zoning Board of Appeals plan review conducted for: - #72 School St. - Comments sent.

FY 23 Priority FBI Risk Violations of Interest

Establishment	Date	Inspection Type	Violation(s)	Corrective Action/Follow-up
Masala Art	6/27	Routine	703.11 (C) Methods-Hot Water and Chemical: The main dishwasher and the kitchen was not dispensing the chlorine sanitizer. 3-501.16 (A)(2) (B) Proper Cold Holding Temps.: Desert fridge in kitchen was running at about 45°F	Sanitizer was replaced in dishwasher (COS); fridge is in the process of being serviced.
Cookie Monstah	6/3	Routine	4-501.114 (A)-(C) Chem. San. Temp./pH/Concentr./Hard: Sanitizer under concentration.	Corrected on site.
Needham Pool & Racket Club	6/1	Pre-operation	Pr: 4-501.114 (E) Chem. San. Temp./pH/Concentr./Hard.: No food grade sanitizer available.	Manager said he has created one and will educate staff about it and use of the 3-bay and this will be confirmed during a routine inspection.
Mandarin Cuisine	6/15	routine	3-302.11 (A)(2) Raw Animal Foods Separated from each other: bins of raw chicken were stored next to a pallet of eggs 3-501.14 (A) Cooling Cooked Foods: r Cooked dumplings were at 90°F and were left out after cooking. 3-501.18 Ready-to-Eat Food Disposition: Some of the foods had past used-by dates. 4-102.11 (A)(1) & (B)(2) Characteristics: Observed the use of single use plastic tofu containers to store various food products	All violations were corrected onsite.

Briarwood Healthcare Center	6/24	routine	3-501.16 (A)(2) (B) Proper Cold Holding Temps.: 2 door Traulesen is not maintaining proper temperature. Numerous TCS foods in danger zone	Food was moved to working fridge until fridge was replaced or serviced.
Sweet Tomato	6/24	routine	3-501.16 (A)(2) (B) Proper Cold Holding Temps: Tomato sauce was stored at room temp in the danger zone.	Staff educated that sauce must be held at 41F or below.
Abbott's	6/22	routine	3-501.14 (B) Cooling TCS Ingredients at Ambient Temperature: The temperature of the Ambient in the Undercounter cooler was 46 degrees.	COS
Micromarket at the Exchange	6/21	routine	2-201.11 (A) (1) Responsibility of the Permit Holder, PIC, & Conditional Employee: Missing food employee reporting agreement	Educated, provided copies and will start to keep going forward.
Mitchell Elementary	5/18	routine	4-101.11 (A) Characteristics - Kitchen – Pr: Food Safety 101 checklist, question 31 'Shelves durable/cleanable surface' is out of compliance. Shelves are rusty Code: Materials that are used in the construction of utensils and food contact surfaces of equipment may not allow the migration of deleterious substances or impart colors, odors, or tastes to FOOD and under normal use conditions shall be safe.	Facilities/kitchen managers would figure out how to repair or replace shelves.
French Press	6/14	routine	3-501.16 (A)(2) (B) Proper Cold Holding Temps: Upright fridge next to upright freezer was registering at 45°F 7-201.11 Storage Separation: Chemicals were store next to single use utensils	Re-inspected. Fridge was overcrowded. Corrected.
The James	6/12	routine	3-302.11 (A)(2) Raw Animal Foods Separated from each other: Observed raw chicken stored above shellfish. 3-501.16 (A)(2) (B) Proper Cold Holding Temps.: Scallops, burgers under grill were over temp. Bain marie in food prep area by stove was over temp.	Reinspection confirmed these issues were corrected.

Blue on Highland	6/6	routine	3-302.11 (A)(1) Raw Animal Foods Separated from RTE: In one of the prep fridges in kitchen, there was a bin of broccoli next to bins of mussels and raw shrimp 3-501.16 (A)(2) (B) Proper Cold Holding Temps: One of the main prep fridge was over temp.	Reinspection performed and items were confirmed.
Dragon Chef	6/7	routine	3-302.11 (A)(2) Raw Animal Foods Separated from each other: Raw meat skewers were stored next and above to raw green beans in fridge by oven. Raw chicken was incorrectly store in the walk in fridge. 4-501.114 (A)-(C) Chem. San. Temp./pH/Concentr./Hard.: Concentration of Chlorine in the 3-bay was too strong. 3-501.16 (A)(2) (B) Proper Cold Holding Temps.: garlic and oil mixture and eggs not held under refrigeration.	Reinspection performed and issues were observed to be corrected.

Category	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	FY'23	FY'22	FY'21	FY '20	FY' 19	FY' 18
Biotech registrations/Plan rev./Insp.	1	0	0	0	1	1	0	0	0	0	0	0	3	3	0	1	1	1
Bodywork Estab. Insp.	0	0	0	0	0	5	0	0	0	0	0	0	5	5	6	7	14	11
Bodywork Estab. Permits	1	0	0	0	0	5	0	0	0	0	0	0	6	5	13	9	9	6
Bodywork Pract. Permits	0	0	0	0	0	5	0	0	0	0	0	0	5	8	12	23	21	22
COVID 19 Complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	3	123	0	0	0
COVID 19 Follow Ups	0	0	0	0	0	0	0	0	0	0	0	0	0	3	122	0	0	0
Demo reviews	6	6	4	5	3	5	2	4	2	4	5	7	53	89	76	73	104	105
Domestic Animal permits	4	0	0	0	0	0	0	0	0	0	0	13	17	15	29	1	21	19
Domestic Animal Inspections	0	0	0	0	1	0	0	0	0	0	0	0	1	10	8	3	22	3
Food Service Routine insp.	12	11	10	15	26	27	19	18	21	18	15	22	214	194	134	149	200	225
Food Service Pre-oper. Insp.	0	1	1	3	1	2	3	1	2	1	6	1	22	22	16	48	12	32
Retail Food Routine insp. Or 6 month check in	0	1	2	2	0	0	0	0	0	3	5	0	13	11	12	33	46	60
Residential Kitchen Routine insp.	0	3	1	0	0	0	0	0	2	0	1	1	8	5	5	3	6	8
Mobile Routine insp.	0	0	0	0	2	1	0	0	0	1	3	3	10	10	10	4	17	13
Food Service Re-insp.	6	4	0	2	9	5	4	0	1	1	1	4	37	27	7	21	28	53
Food Establishment Annual/Seasonal Permits	0	0	1	32	23	66	5	0	2	1	0	0	130	138	134	155	140	171
Temp. food permits	4	4	4	2	0	1	1	2	5	7	1	2	33	37	9	67	134	163
Temp. food inspections	3	2	2	0	0	0	0	1	4	1	1	2	16	9	3	10	37	29
Farmers Market permits	1	0	2	0	0	0	0	0	0	0	7	1	11	16	15	14	14	14
Farmers Market insp.	11	11	18	15	0	0	0	0	0	0	0	18	73	149	124	158	229	127
Food Complaints	1	0	2	2	1	1	0	2	0	1	0	1	11	13	7	49	18	20
Follow-up food complaints	2	0	2	2	1	1	0	2	0	1	0	1	12	15	8	48	21	21
Food Service Plan Reviews	4	5	2	7	7	10	6	8	7	5	9	5	75	13	12	14	20	42
Food Service Admin. Hearings	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	0
Grease/ Septage Hauler Permits	1	0	0	0	7	19	1	0	0	1	0	0	29	22	13	20	21	24
Housing (Chap II Housing) Annual routine inspection	0	1	0	8	0	0	0	0	0	0	0	0	9	10	7	7	0	14
Housing Follow-up insp.	1	0	6	5	1	0	0	0	0	0	0	0	13	3	2	0	0	5
Housing New Complaint	2	2	2	0	3	4	6	2	0	1	2	2	26	41	40	41	22	22
Housing Follow-ups	6	7	11	7	5	9	9	4	2	3	3	3	69	65	63	56	28	24
Hotel Annual inspection	0	0	0	0	1	2	0	0	0	0	0	0	3	3	3	3	3	3
Hotel Follow-ups	0	1	0	0	0	1	0	0	0	0	0	0	2	0	1	15	0	0
Nuisance Complaints	2	1	1	1	1	2	4	2	3	3	8	8	36	35	45	34	55	42
Nuisance Follow-ups	5	4	4	4	2	5	6	2	3	3	9	11	58	41	60	55	69	42
Pool inspections	0	0	0	0	0	7	0	0	0	0	5	2	14	15	15	13	20	12
Pool Follow up inspections	0	0	0	0	0	2	2	0	0	0	1	0	5	4	5	3	12	7
Pool permits	0	0	0	0	0	6	2	0	0	0	4	2	14	15	17	11	19	12
Pool plan reviews	0	0	0	0	0	0	0	0	0	0	5	0	5	0	5	0	3	44
Pool variances	0	0	0	0	0	4	2	0	0	0	1	0	7	6	5	6	5	7
Septic Abandonment	1	1	0	0	0	0	0	0	1	0	0	1	4	9	17	21	9	5
Addition to a home on a septic plan rev/approval	0	0	0	0	0	0	0	0	0	0	1	1	2	15	5	5	2	2
Septic Install. Insp.	2	0	1	0	1	6	0	0	1	3	0	8	22	19	11	13	21	28
Septic COC for repairs	1	0	0	0	1	0	0	0	0	0	0	0	2	3	2	5	3	1
Septic COC for complete septic system	0	0	0	2	0	0	0	1	0	0	0	0	3	4	1	3	4	3
Septic Info. requests	6	5	6	7	6	4	5	6	5	4	3	5	62	64	86	61	62	51
Septic Soil/Perc Test.	0	1	0	0	0	0	0	0	2	0	2	1	6	5	8	1	1	2
Septic Const. permits	0	0	0	0	1	1	0	0	1	0	0	2	5	6	6	6	6	5
Septic Installer permits	0	0	0	0	2	6	0	2	2	1	0	3	16	11	8	6	8	9
Septic Installer Tests	0	0	0	0	0	0	0	0	2	1	0	6	9	4	3	2	5	3
Septic Deed Restrict.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1	3
Septic Plan reviews	2	3	3	5	2	2	2	1	2	3	4	0	29	21	14	8	9	23
Septic Trench permits	0	0	0	0	0	1	0	3	1	3	0	3	11	12				
Disposal of Sharps permits	0	1	0	0	1	7	1	0	0	0	0	0	10	7	8	7	7	9
Disposal of Sharps Inspections	0	1	0	0	1	9	1	0	0	0	0	0	12	8	8	7	7	7
RMD	0	0	0	0	0	0	0	0	0	0	0	2	2					

Planning Board Subdivision Sp Permit Plan reviews/Insp. of lots	1	2	2	3	2	0	0	3	1	2	3	0	19	21	20	4	1	1
Subdivision Bond Releases	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	1	0
Special Permit/Zoning	2	0	2	3	2	1	2	0	5	1	0	1	19	21	18	17	34	15
Tobacco permits	0	0	0	0	2	3	1	0	0	0	1	0	7	6	7	10	10	11
Tobacco Routine insp	0	0	0	0	0	0	6	0	0	0	1	0	7	12	7	8	14	18
Tobacco Follow-up insp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8	3	3
Tobacco Compliance checks	0	0	0	0	0	0	6	0	0	0	0	0	6	6	6	30	30	41
Tobacco complaints	1	0	0	2	1	0	0	1	1	0	0	0	6	0	0	2	3	4
Tobacco Compl. follow-ups	1	0	0	2	1	0	0	1	1	0	0	0	6	0	0	1	3	4
Trash Hauler permits	0	0	0	0	1	1	1	1	4	9	3	0	20	23	16	15	17	14
Medical Waste Hauler permits	0	0	0	0	1	4	1	0	0	0	0	0	6	2	2	2	2	1
Well - Plan Reviews, Permission to drill letters, Insp.	2	4	1	0	0	0	0	4	1	2	0	0	14	10	11	2	6	2
Well Permits	1	0	0	0	0	0	0	0	0	0	0	0	1	4	1	1	1	0

Crumb Rubber Monitoring Results

**Memorial Park & DeFazio Park
Needham, Massachusetts**

Needham Health Department

Needham, Massachusetts

June 2023



FUSS & O'NEILL

108 Myrtle Street, Suite 502
Quincy, MA 02171



FUSS & O'NEILL

June 28, 2023

Ms. Tara Gurge, R.S., C.E.H.T., M.S.
Assistant Public Health Director
Needham Public Health Division
Health and Human Services Department
178 Rosemary Street
Needham, MA 02494

RE: **Crumb Rubber Monitoring Results – May 2023**
Memorial and DeFazio Parks
Needham, Massachusetts
Fuss & O'Neill Project No. 20081266.B40

Dear Ms. Gurge:

Enclosed is the summary report for crumb rubber testing performed at the artificial turf athletic fields located at Memorial Park and DeFazio Park in Needham, Massachusetts in May 2023.

If you should have any questions regarding the contents of this report, please do not hesitate to contact me at (617) 282-7890. Thank you for this opportunity to have served your environmental needs.

Sincerely,

Wendy Tram, EIT
Project Manager

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Enclosure

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APPENDIX B - SAMPLING EQUIPMENT
APPENDIX C - FIELD DATA SHEETS

1 Introduction and Background

Fuss & O'Neill, Inc. (Fuss & O'Neill) was retained by the Needham Health Department to perform periodic monitoring of the crumb rubber used at the artificial turf athletic fields in Needham, Massachusetts. The study involved the collection of field measurements and crumb rubber samples from Memorial Park (Needham High School Field, 92 Rosemary Street) and DeFazio Park (Brock Field and Founders Field, 380 Dedham Avenue) for laboratory analysis. The laboratory data were compared to toxicity reference data from the Massachusetts Department of Environmental Protection (MassDEP) and/or US Environmental Protection Agency (EPA) to evaluate potential health-related impacts.

On May 31, 2023, Mr. Evan Koncewicz of Fuss & O'Neill performed the crumb rubber sampling for the Needham Health Department (the "Client") in accordance with our proposal dated April 13, 2023.

2 Methodology and Scope of Testing

On May 31, 2023, Mr. Koncewicz of Fuss & O'Neill met Ms. Tara Gurge of the Needham Health Department to access the three athletic fields to perform the sampling and monitoring activities. A three-point composite sample of crumb rubber was collected from each artificial turf athletic field using a plastic trowel and scoop. The composite samples were comprised of crumb rubber collected from the two ends and the middle of each artificial turf athletic field. Diagrams depicting sample locations are included as *Figure 1* (Memorial Park) and *Figure 2* (DeFazio Park). Samples were collected from the Needham High School Field in Memorial Park, and from Founders Field and Brock Field in DeFazio Park.

The composite samples were submitted to EMSL Analytical Laboratory in Cinnaminson, New Jersey (EMSL). The crumb rubber was analyzed for trace metals by Environmental Protection Agency (EPA) Methods 6020/7471 (inductively coupled plasma atomic emission spectrometry [ICP-AES] and mercury by manual cold-vapor technique, respectively); semi-volatile organic compounds (SVOCs) by EPA Method 8270; and volatile organic compounds (VOCs) by EPA Method TO-15 (analyzed by gas chromatography/mass spectrometry (GC/MS)). The VOCs were collected from a "closed container" test, with an air headspace over a sample of the crumb rubber heated to 120°F for one hour. A "tentatively identified compound" (TIC) search was performed in connection with the analytical data.

The purpose of the closed container VOC test was to determine what concentrations and types of VOCs could be generated from the crumb rubber in a heated state, e.g. a field with full sun on summer day. Refer to *Appendix A* for the laboratory analytical reports and chain of custody forms. Refer to *Table 1* for a summary of the analytical results.

Real-time ambient conditions were monitored during crumb rubber sampling. TOV (total organic vapors) were measured using an Ion Science Tiger Photoionization Detector (PID). A TSI Q-Trak Air Quality Monitor was used to record ambient temperature and relative humidity (RH). Refer to *Appendix B* for a list of sampling equipment, and *Table 2* for real-time measurements.

3 Results

Analytical data are summarized in *Table 1*. Multiple VOCs (including TICs) were identified in each sample. The following VOCs were detected in the gas stream samples:

- 2-Butanone (MEK)
- 4-Methyl-2-Pentanone (MIBK)
- Acetone
- Ethanol
- Isopropyl alcohol (2-Propanol)
- Methylene chloride
- Propylene
- Tertiary butyl alcohol (TBA)

Furthermore, 1-propene 2-methyl- and acetaldehyde were identified in all three samples as TICs in the analyses. Carbonyl sulfide was detected in the two samples collected from DeFazio Park (Founders and Brock Fields). Concentrations of undefined TIC(s), assigned by the laboratory as equivalent toluene for conversion purposes, were identified in all three samples. As indicated in the laboratory narrative, there is presumptive evidence of acetaldehyde based on the TIC library match.

Chromium, iron, lead, manganese, and zinc were each detected in all three samples. Arsenic, cadmium, mercury, and selenium were not detected in any sample.

Eleven SVOCs were identified in each of the rubber samples. The majority of SVOCs all within the class of “polycyclic aromatic hydrocarbons” (PAHs), with the exception of acetophenone and n-nitrosodiphenylamine. While 11 SVOCs were identified in each sample, *Table 1* includes the EPA-designated “Priority Pollutant” PAHs, which include multiple similar compounds.

VOCs were recorded at concentrations at an average or below 0.4 parts per million by volume (ppmv) in ambient air. Readings less than 1.0 ppmv may occur as a result of moisture in ambient air. The ambient relative humidity at the time of sampling was between 9.5 and 26.5 percent, within a 93.1- to 104.7-degree Fahrenheit environment (recorded within a few inches of the surface).

4 Data Evaluation

The Massachusetts Contingency Plan (MCP; 310 CMR 40.0000) establishes soil standards for a variety of uses based on publicly-available toxicity data for a range of compounds, including VOCs, SVOCs, and metals. The numerical standards and their derivations are publicly-available.¹ MassDEP generally establishes these standards based on four criteria:

¹ MassDEP, December 2017, “MCP Numerical Standards.” <https://www.mass.gov/doc/mcp-numerical-standards-derivation/download>, accessed June 2023.

- Publicly-available toxicity data, including EPA and MassDEP Office of Research and Standards (ORS) data, and peer-reviewed industry sources.
- Typical background levels in New England soil.
- Ceiling concentrations (i.e. maximum concentrations set for compounds of limited toxicity).
- Practical quantification limits (PQLs), i.e. levels which analytical laboratories can reliably quantify.

In its toxicity calculations for Method S-1 Soil Standards (applicable to sensitive land uses, including residences, schools and day-care facilities), MassDEP considers inhalation and skin-absorption risks over exposures from infancy to adulthood. Fuss & O'Neill evaluated the crumb rubber analytical results relative to MassDEP's published toxicity levels (i.e. the levels which would be used in the absence of ceiling, background or PQL considerations). These values are included in *Table 1*. Where MassDEP has not published toxicity values, Fuss & O'Neill consulted the EPA "regional screening levels," (RSLs) last updated in May 2023, which consist of similarly-derived guidance values for a range of compounds used for screening contaminant concentrations on sites evaluated under the Superfund program.² Where RSLs were incorporated into this evaluation, the "non-carcinogenic child screening levels" for resident soil and resident air were generally the most conservative values and were incorporated herein.

With the exceptions of n-nitrosodiphenylamine, carbonyl sulfide, 1-propene, 2-methyl-, and ethanol, MassDEP and/or EPA values were available for all detected compounds.

As noted in *Table 1*, VOC compound acetaldehyde was detected in all three samples at concentrations (maximum 0.049 mg/m³) greater than the EPA Resident Air RSL (0.0094 mg/m³). Concentrations of acetaldehyde have been detected in samples since 2009, ranging from non-detections to 0.0811 mg/m³. As in the past (where reported), acetaldehyde was not detected in laboratory background samples. Refer to *Appendix A* for analytical data of the laboratory background sample.

As in the past, acetaldehyde was reported by the laboratory as a TIC. TICs are compounds that are not method target compounds (for which there are calibration standards). The identification of TICs is based upon a search of the TIC's mass spectrum against a mass spectral library available in the instrument's software as TICs are not contained in the calibration standards. Because TICs are not contained in the calibration standards, the calculation of the concentration of TICs are estimates. As indicated in the laboratory narrative, TIC data is qualified as estimated values which have presumptive evidence of the presence of the compound based on the library match. Further, the EPA does not consider the identification as absolute or confirmed until a known standard for the suspect compound can be analyzed on the same instrument which made the tentative identification³.

According to EPA, acetaldehyde is ubiquitous in the environment, a product of combustion including automobile exhaust and may be formed from the breakdown of ethanol. The predominant use of

² EPA, May 2021. "Regional Screening Levels – Generic Tables." <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables>, accessed June 2023.

³ EPA, Feb 2006. "Tentatively Identified Compounds." <https://19january2017snapshot.epa.gov/sites/production/files/2015-06/documents/tics.pdf>, accessed June 2023.

acetaldehyde is as an intermediate in the synthesis of other chemicals. According to the Hazard Summary⁴ for acetaldehyde, chronic intoxication (for noncancer effects) of acetaldehyde in humans resemble those of alcoholism, human data regarding the carcinogenic effects of acetaldehyde are inadequate, and there is no information available on reproductive or developmental effects of the compound in humans. Note that EPA has not established a Reference Dose, a reference point from which to gauge the potential effects of the chemical at other doses, for acetaldehyde.

The RSL considers the potential for noncancer effects to develop in children and adults via the inhalation route, only. The Resident Air RSL considers that the receptor spends most, if not all, of the day at home and performing home chores as well as outdoor activities. The resident is assumed to be exposed to contaminants via inhalation of ambient air, with no assumption of how contaminants get into the air.

As noted on *Table 1*, zinc was detected in one sample at a concentration (13,200 mg/kg) slightly greater than the MassDEP threshold value (13,000 mg/kg), but within the historically reported range. The remaining zinc concentrations were less than the respective risk-based value. The MassDEP exposure levels assume continuous high-contact exposure (five days per week, 30 weeks per year) over a multiple-year duration and are therefore conservative with regard to the actual exposures for users of the field.

With the exception of acetaldehyde and zinc, the remaining detections for metals, VOCs, and SVOCs were less than the risk-based levels.

5 Conclusions

Fuss & O'Neill collected field and analytical data to characterize the crumb rubber at three fields in Needham, Massachusetts in May, 2023. The analytical results were compared to MassDEP and/or EPA risk-based guidance levels for soil and air, to evaluate potential health risks associated with the use of the crumb rubber media on these athletic fields. The follow conclusions were formed:

- The estimated concentration of VOC compound acetaldehyde in all three samples exceeded the EPA RSL, which is a noncancer risk-based concentration used to develop a single chemical threshold value in residential ambient settings. As noted above, acetaldehyde is ubiquitous in the environment, a product of combustion including automobile exhaust, and may be formed from the breakdown of ethanol. The predominant use of acetaldehyde is as an intermediate in the synthesis of other chemicals. According to the Hazard Summary for acetaldehyde, chronic intoxication (for noncancer effects) of acetaldehyde in humans resemble those of alcoholism, human data regarding the carcinogenic effects of acetaldehyde are inadequate, and there is no information available on reproductive or developmental effects of the compound in humans. Note that EPA has not established a Reference Dose for acetaldehyde.

⁴ EPA, "Acetaldehyde Hazard Summary." <https://www.epa.gov/sites/default/files/2016-09/documents/acetaldehyde.pdf>, accessed June 2023.

- The concentrations of zinc in one of three samples were slightly greater than the MassDEP threshold value, which is derived from an assumption of high-intensity exposure for a multi-year duration on a consistent basis.
- The remaining reported concentrations of metals, VOCs and SVOCs were less than the threshold values.

Tables

Table 1
Summary of Crumb Rubber Monitoring Results – May 31, 2023

Analyte	Analytical Results			Risk-Based Levels
	<u>Memorial Park</u>	<u>DeFazio Park</u>		
	Needham High School 1708230531-03	Founders Field 1708230531-02	Brock Field 1708230531-01	
Polycyclic Aromatic Hydrocarbons** – dry weight (mg/kg) by method 3546/8270D				
2-Methylnapthalene	ND < 0.085	ND < 0.085	ND < 0.088	280
Acenaphthene	ND < 0.0425	ND < 0.0425	ND < 0.044	4,300
Acenaphthylene	0.0763	0.0735	0.071	2,100
Acetophenone	0.146	0.170	0.125	7,800
Anthracene	0.113	0.0882	0.0851	21,000
Benzo(a)anthracene	ND < 0.0425	ND < 0.0425	ND < 0.044	72
Benzo(a)pyrene	ND < 0.0425	ND < 0.0425	ND < 0.044	0.72
Benzo(b)fluoranthene	ND < 0.0425	ND < 0.0425	ND < 0.044	7.2
Benzo(g,h,i)perylene	1.290	1.480	ND < 0.044	2,100
Benzo(k)fluoranthene	ND < 0.0425	ND < 0.0425	ND < 0.044	72
Bis(2-Ethylhexyl)phthalate	5.070	6.510	4.430	93
Chrysene	1.780	ND < 0.0425	1.810	72
Dibenz(a,h)anthracene	ND < 0.0425	ND < 0.0425	ND < 0.044	0.72
Fluoranthene	4.650	3.790	3.190	2,800
Fluorene	ND < 0.0425	ND < 0.0425	ND < 0.044	2,800
Indeno(1,2,3-cd)pyrene	ND < 0.0425	ND < 0.0425	ND < 0.044	72
Naphthalene	0.0889	0.0920	0.0883	1,400
N-Nitrosodiphenylamine	ND < 0.085	0.128	0.134	NE
Phenanthrene	0.717	0.569	0.582	2,100
Pyrene	7.110	6.780	6.000	2,100
Volatile organic compounds – vapor (mg/m³) Closed Container Test by method TO-15				
2-Butanone (MEK)	0.032	0.031	0.035	5.00
4-Methyl-2-Pentanone (MIBK)	0.380	0.350	0.300	3.00
Acetone	0.360	0.350	0.380	0.8
Ethanol	0.340	0.130	0.210	NE
Isopropyl alcohol (2-Propanol)	0.180	0.063	0.100	NE [0.210]
Methylene chloride	0.020	0.011	0.014	NE [0.63]
Propylene	ND < 0.0086	0.018	0.011	NE [3.100]
Tertiary butyl alcohol (TBA)	0.0078	0.0090	0.0075	NE [5.200]
Carbonyl Sulfide*	NR	0.040	0.025	NE
1-Propene, 2-Methyl-*	0.065	0.170	0.100	NE
Acetaldehyde*	<u>0.029</u>	<u>0.049</u>	<u>0.046</u>	NE [0.0094]
Unknown*	0.150	0.170	0.018	NE

Analyte	Analytical Results			Risk-Based Levels
	<u>Memorial Park</u>	<u>DeFazio Park</u>		
	Needham High School 1708230531-03	Founders Field 1708230531-02	Brock Field 1708230531-01	
Total Metals – dry weight (mg/kg) by methods 3051A/6020B & 7471B				
Arsenic	ND < 1.5	ND < 1.5	ND < 1.5	2.2
Cadmium	ND < 0.50	ND < 0.50	ND < 0.49	71
Chromium	2.4	2.8	2.2	130
Iron	554	748	816	NE [55,000]
Lead	9.0	9.0	11.7	110
Manganese	5.0	6.2	6.2	NE [1,800]
Mercury	ND < 0.047	ND < 0.048	ND < 0.047	18
Selenium	ND < 2.5	ND < 2.5	ND < 2.5	380
Zinc	10,900	<u>13,200</u>	12,800	13,000

* Tentatively-identified compound

**For the SVOC full list, refer to the laboratory analytical report

ND: None Detected; NE: risk threshold not established by MassDEP or EPA.

NE [X]: not established by MassDEP, value is EPA “regional screening level” for risk screening at Superfund sites.

Chromium risk level conservatively assumes hexavalent (Cr-VI) form.

VOCs and TICs were only reported if detected in at least one sample.

Underlined value indicates that the detected value exceeds the Risk Based Level.

Table 2
Real-Time Measurements, Needham Crumb Rubber Sampling – May 31, 2023

Location	TOV (ppm)	Temperature (°F)	RH (%)
Needham High School (HS)	0.2	104.7	9.5
Brock Field (D1)	0.2	93.1	26.5
Founders Field (D2)	0.4	99.8	16.7

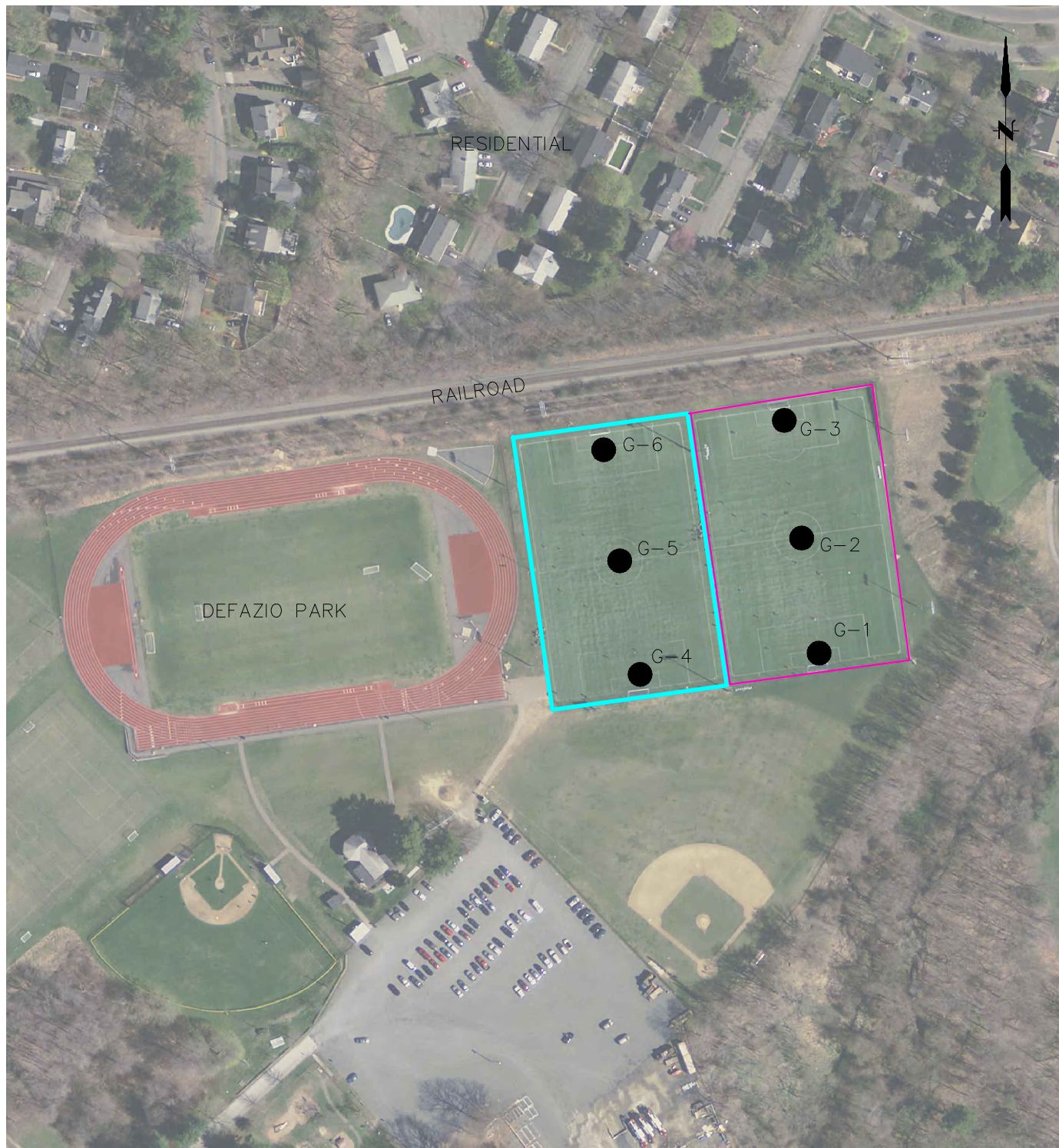
The TOV value was taken as the highest detected in the sampling locations. Temperature and relative humidity were taken as the average detected in the sampling locations.

°F: degrees Fahrenheit

RH: Relative Humidity

TOV: Total Organic Vapor

Figures



MAP REFERENCE

THIS MAP WAS PREPARED FROM USGS ORTHOPHOTOGRAPHY, (c) 2013 MASSGIS.

SOURCE: OFFICE OF GEOGRAPHIC AND ENVIRONMENTAL INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS.

FIELD BOUNDARIES APPROXIMATE BASED ON SITE OBSERVATIONS

LEGEND

-  FOUNDERS FIELD BOUNDARY
-  BROCK FIELD BOUNDARY
-  SAMPLE LOCATIONS TO FORM COMPOSITE

SCALE:
HORZ.: 1" = 150'
VERT.:
DATUM:
HORZ.:
VERT.:
0 75' 150'
GRAPHIC SCALE



FUSS & O'NEILL

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NEEDHAM HEALTH DEPARTMENT

SITE PLAN
DEFAZIO PARK
380 DEDHAM ROAD

NEEDHAM

MASSACHUSETTS

PROJ. No.: 20081266.B40
DATE: MAY 2023

FIGURE 2



MAP REFERENCE

THIS MAP WAS PREPARED FROM USGS ORTHOPHOTOGRAPHY, (c) 2013 MASSGIS.

SOURCE: OFFICE OF GEOGRAPHIC AND ENVIRONMENTAL INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS.

MEMORIAL FIELD BOUNDARIES APPROXIMATE BASED ON SITE OBSERVATIONS

LEGEND

PARK BOUNDARY

SAMPLE LOCATIONS TO FORM COMPOSITE

SCALE:
HORZ.: 1" = 150'
VERT.:
DATUM:
HORZ.:
VERT.:
0 75' 150'
GRAPHIC SCALE



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NEEDHAM HEALTH DEPARTMENT

SITE PLAN
 MEMORIAL PARK
 92 ROSEMARY ROAD

NEEDHAM

MASSACHUSETTS

PROJ. No.: 20081266.B40
 DATE: MAY 2023

FIGURE 1

Appendix A

Laboratory Analytical Reports & Chain of Custody Forms

**EMSL ANALYTICAL, INC.**

200 Route 130 North
Cinnaminson, NJ 08077
Telephone: (856)858-4800 FAX: (856)858-4571
to15lab@EMSL.com | <http://www.EMSL.com>

EMSL ORDER ID: 492300463
EMSL CUSTOMER ID: ENVI54

Attention: Wendy Tram
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA -
20081266.B20

Phone: 860-646-2469
Email: wtram@fando.com

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Laboratory Report- Sample Summary

EMSL Sample ID.	Client Sample ID.	Start Sampling Date	Start Sampling Time
492300463-0001	1708230531-01		
492300463-0002	1708230531-02		
492300463-0003	1708230531-03		
492300463-BCKG	Lab Background		

If "Preliminary Report" is displayed in the signature box; this indicates that there are samples that have not yet been analyzed, that are in a preliminary state, or that analysis is in progress but not completed at the time of report issue.

Report Date
6/15/2023

Report Revision
R0

Revision Comments
Initial Report

Owen McKenna, Chemistry Laboratory Director
or other approved signatory

**Test results meet all NELAP requirements unless
otherwise specified. NJDEP Certification #: 03036**

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted.

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20081266.B20

Phone: 860-646-2469
Email: wtram@fando.com

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Case Narrative

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

Column

Restek RTX-502.2, 60m, 0.25mm ID, 1.4um

Concentrator Traps:

Entech Dual Cold Traps: (1) 1/8" No Packing, (2) 1/8" Tenax.

Gas Standards:

Certified Gas standards were used for all analyses.

Sample Volumes:

Sample volume aliquots for this procedure are 250cc for indoor/ ambient air and 25cc for soil gas. Other volumes for sample dilutions are reflected on each result page.

Holding Times:

Standard holding times of 30 days were met for all samples.

Sampling Pressures:

All samples were received at acceptable pressure/vacuum unless listed below.
Bulk samples for off gas analysis.

Sample Dilutions:

Dilutions reported are designated by the sample # with a "DL" suffix resulting from initial analysis having compounds exceeding calibration as reported with an "E" qualifier. Ethanol and Isopropanol are not diluted for and may be reported with an "E" qualifier on the final result.

QA/QC criteria outside method specifications are listed below (if applicable).

Initial Calibration

All Initial Calibration criteria met method specification.

Initial Calibration Verification Standard (ICVS)- Second Source

ICVS met method specification with 70-130% recovery for 100% of compounds.

Laboratory Control Sample (LCS)

LCS met method specification with 70-130% recovery for 100% of compounds. (If the LCS does not meet criteria but any compounds which have recoveries >130% are not found in the samples, samples may be reported)

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Case Narrative

Continuing Calibration Verification Standard (CCVS)

CCVS met method specification with all compounds within 30% deviation.

Ending Calibration Verification Standard (ECVS)

ECVS met method specification with all compounds within 30% deviation.

Method Blanks (MB)

Method Blank met method specification.

Reporting Limit Laboratory Control Samples (RLLCS)

RLLCS met method specification with 90% of compounds within the 60-140% recovery range. Individual compounds outside of the recovery range may be listed below.

Manual Integration : -Listed below if applicable. Before and after documentation provided in extended deliverable packages.

The following data qualifiers that may have been reported with the data.

ND- Non Detect. This notation would be used in the results column in lieu of a "U" qualifier.

U- Compound was analyzed for but not detected at a listed and appropriately adjusted reporting level.

J (Target)- Concentration estimated between Reporting Limit and MDL.

J- Estimated value reported below adjusted reporting limit for target compounds or estimating a concentration for TICs where a 1:1 response is assumed

B- Compound found in associated method blank as well as in the sample.

E- Estimated value exceeding upper calibration range of instrument. Ethanol and isopropyl alcohol are not specifically targeted to dilute within calibration range.

D- Compound reported from additional diluted analysis.

N- indicates presumptive evidence of a compound based on library search match.

EMSL Analytical, Inc. certifies that this data package is in compliance with the terms and conditions of this contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer –readable data submitted on diskette has been authorized by the laboratory manager or his/her designee, as verified by the following signature.

Owen McKenna, Chemistry Laboratory Director
or other approved signatory

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EMSL ORDER ID: 492300463
EMSL CUSTOMER ID: ENVI54
EMSL SAMPLE ID: 492300463-0001
CUSTOMER SAMPLE ID: 1708230531-01

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Phone: 860-646-2469
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Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10741.D	JARL22	25 cc	10

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
Propylene	115-07-1	42.08	6.4	5.0		11	8.6	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	ND	2.0		ND	10	
Freon 114(1,2-Dichlorotetrafluoroethan	76-14-2	170.9	ND	2.0		ND	14	
Chloromethane	74-87-3	50.49	ND	2.0		ND	4.1	
n-Butane	106-97-8	58.12	ND	2.0		ND	4.8	
Vinyl chloride	75-01-4	62.50	ND	2.0		ND	5.1	
1,3-Butadiene	106-99-0	54.09	ND	2.0		ND	4.4	
Bromomethane	74-83-9	94.94	ND	2.0		ND	7.8	
Chloroethane	75-00-3	64.51	ND	2.0		ND	5.3	
Ethanol	64-17-5	46.07	110	10		210	19	
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	2.0		ND	8.7	
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	2.0		ND	11	
Isopropyl alcohol(2-Propanol)	67-63-0	60.09	40	5.0		100	12	
Freon 113(1,1,2-Trichlorotrifluoroethan	76-13-1	187.4	ND	2.0		ND	15	
Acetone	67-64-1	58.08	160	2.0		380	4.8	
1,1-Dichloroethene	75-35-4	96.94	ND	2.0		ND	7.9	
Acetonitrile	75-05-8	41.05	ND	2.0		ND	3.4	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	2.5	2.0		7.5	6.1	
Bromoethane(Ethyl bromide)	74-96-4	109.0	ND	2.0		ND	8.9	
3-Chloropropene(Allyl chloride)	107-05-1	76.52	ND	2.0		ND	6.3	
Carbon disulfide	75-15-0	76.14	ND	2.0		ND	6.2	
Methylene chloride	75-09-2	84.93	4.1	2.0		14	6.9	
Acrylonitrile	107-13-1	53.08	ND	2.0		ND	4.3	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.15	ND	2.0		ND	7.2	
trans-1,2-Dichloroethene	156-60-5	96.94	ND	2.0		ND	7.9	
n-Hexane	110-54-3	86.18	ND	2.0		ND	7.0	
1,1-Dichloroethane	75-34-3	98.96	ND	2.0		ND	8.1	
Vinyl acetate	108-05-4	86.09	ND	2.0		ND	7.0	
2-Butanone(MEK)	78-93-3	72.11	12	2.0		35	5.9	
cis-1,2-Dichloroethene	156-59-2	96.94	ND	2.0		ND	7.9	
Ethyl acetate	141-78-6	88.11	ND	2.0		ND	7.2	
Chloroform	67-66-3	119.4	ND	2.0		ND	10	
Tetrahydrofuran	109-99-9	72.11	ND	2.0		ND	5.9	
1,1,1-Trichloroethane	71-55-6	133.4	ND	2.0		ND	11	
Cyclohexane	110-82-7	84.16	ND	2.0		ND	6.9	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.2	ND	2.0		ND	9.3	
Carbon tetrachloride	56-23-5	153.8	ND	2.0		ND	13	
n-Heptane	142-82-5	100.2	ND	2.0		ND	8.2	
1,2-Dichloroethane	107-06-2	98.96	ND	2.0		ND	8.1	
Benzene	71-43-2	78.11	ND	2.0		ND	6.4	
Trichloroethene	79-01-6	131.4	ND	2.0		ND	11	
1,2-Dichloropropane	78-87-5	113.0	ND	2.0		ND	9.2	
Methyl Methacrylate	80-62-6	100.1	ND	2.0		ND	8.2	
Bromodichloromethane	75-27-4	163.8	ND	2.0		ND	13	
1,4-Dioxane	123-91-1	88.11	ND	2.0		ND	7.2	

4 of 20

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Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10741.D	JARL22	25 cc	10

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	73	2.0		300	8.2	
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	2.0		ND	9.1	
Toluene	108-88-3	92.14	ND	2.0		ND	7.5	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	2.0		ND	9.1	
1,1,2-Trichloroethane	79-00-5	133.4	ND	2.0		ND	11	
2-Hexanone(MBK)	591-78-6	100.2	ND	2.0		ND	8.2	
Tetrachloroethene	127-18-4	165.8	ND	2.0		ND	14	
Dibromochloromethane	124-48-1	208.3	ND	2.0		ND	17	
1,2-Dibromoethane	106-93-4	187.9	ND	2.0		ND	15	
Chlorobenzene	108-90-7	112.6	ND	2.0		ND	9.2	
Ethylbenzene	100-41-4	106.2	ND	2.0		ND	8.7	
Xylene (p,m)	1330-20-7	106.2	ND	4.0		ND	17	
Xylene (Ortho)	95-47-6	106.2	ND	2.0		ND	8.7	
Styrene	100-42-5	104.1	ND	2.0		ND	8.5	
Isopropylbenzene (cumene)	98-82-8	120.2	ND	2.0		ND	10	
Bromoform	75-25-2	252.7	ND	2.0		ND	21	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	2.0		ND	14	
4-Ethyltoluene	622-96-8	120.2	ND	2.0		ND	10	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	2.0		ND	10	
2-Chlorotoluene	95-49-8	126.6	ND	2.0		ND	10	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	2.0		ND	10	
1,3-Dichlorobenzene	541-73-1	147.0	ND	2.0		ND	12	
1,4-Dichlorobenzene	106-46-7	147.0	ND	2.0		ND	12	
Benzyl chloride	100-44-7	126.6	ND	2.0		ND	10	
1,2-Dichlorobenzene	95-50-1	147.0	ND	2.0		ND	12	
1,2,4-Trichlorobenzene	120-82-1	181.4	ND	2.0		ND	15	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	2.0		ND	21	
Naphthalene	91-20-3	128.2	ND	2.0		ND	10	
Total Target Compound Concentrations:			410	ppbv		1100	ug/m3	

Surrogate

4-Bromofluorobenzene

Result

10

Spike

10

Recovery

100%

Qualifier Definitions**ND = Non Detect**

B = Compound also found in method blank.

E= Estimated concentration exceeding upper calibration range.

D= Result reported from diluted analysis.

J= Concentration estimated between Reporting Limit and MDL.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

EMSL ANALYTICAL, INC.

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EMSL ORDER ID: 492300463

EMSL CUSTOMER ID: ENVI54

EMSL SAMPLE ID: 492300463-0001

CUSTOMER SAMPLE ID: 1708230531-01

Attention: Wendy Tram
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA -
 20081266.B20

Phone: 860-646-2469
Email: wtram@fando.com

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10741.D	JARL22	25 cc	10

Tentatively Identified Compound Results Summary

Tentatively Identified Compounds	CAS#	MW(1)	Result ppbv	Q	Result ug/m3	Retention Time	Comments
Carbonyl sulfide	000463-58-1	60	10	JN	25	5.111	
1-Propene, 2-methyl-	000115-11-7	56	44	JN	100	5.91	
Acetaldehyde	000075-07-0	44	26	JN	46	6.39	
unknown		92	47	JN	180	15.73	
Total TIC Concentrations:			130	ppbv	350	ug/m3	

Qualifier Definitions

(1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.

B = Compound also found in method blank.

J= Estimated value based on a 1:1 response to internal standard.

N= Presumptive evidence of compound based on library match.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

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Attention: Wendy Tram
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Phone: 860-646-2469
Email: wtram@fando.com

EMSL ORDER ID: 492300463
EMSL CUSTOMER ID: ENVI54
EMSL SAMPLE ID: 492300463-0001
CUSTOMER SAMPLE ID: 1708230531-01

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA -
20081266.B20

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10741.D	JARL22	25 cc	10

Total Volatile Organic Compounds (TVOC) Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
Propylene	115-07-1	42.08	6.4	5.0		11	8.6	
Ethanol	64-17-5	46.07	110	10		210	19	
Isopropyl alcohol(2-Propanol)	67-63-0	60.09	40	5.0		100	12	
Acetone	67-64-1	58.08	160	2.0		380	4.8	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	2.5	2.0		7.5	6.1	
Methylene chloride	75-09-2	84.93	4.1	2.0		14	6.9	
2-Butanone(MEK)	78-93-3	72.11	12	2.0		35	5.9	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	73	2.0		300	8.2	
Total Target Compound Concentrations:			410	ppbv		1100	ug/m3	

Qualifier Definitions

B = Compound also found in method blank.
E= Estimated concentration exceeding upper calibration range.
D= Result reported from diluted analysis.
J= Concentration estimated between Reporting Limit and MDL.

Tentatively Identified Compounds	CAS#	MW(1)	Result ppbv		Q	Result ug/m3	Retention Time	Comments
Carbonyl sulfide	000463-58-1	60	10		JN	25	5.111	
1-Propene, 2-methyl-	000115-11-7	56	44		JN	100	5.907	
Acetaldehyde	000075-07-0	44	26		JN	46	6.385	
unknown		92	47		JN	180	15.728	
Total TIC Concentrations:			130	ppbv		350	ug/m3	

Qualifier Definitions

(1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.
B = Compound also found in method blank.
J= Estimated value based on a 1:1 response to internal standard.
N= Presumptive evidence of compound based on library match.

Total Volatile Organic Compounds (TVOCs): 540 ppbv 1500 ug/m3

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Phone: 860-646-2469
Email: wtram@fando.com

EMSL ORDER ID: 492300463
EMSL CUSTOMER ID: ENVI54
EMSL SAMPLE ID: 492300463-0002
CUSTOMER SAMPLE ID: 1708230531-02

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA - 20081266.B20

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10742.D	JARL26	25 cc	10

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
Propylene	115-07-1	42.08	10	5.0		18	8.6	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	ND	2.0		ND	10	
Freon 114(1,2-Dichlorotetrafluoroethane)	76-14-2	170.9	ND	2.0		ND	14	
Chloromethane	74-87-3	50.49	ND	2.0		ND	4.1	
n-Butane	106-97-8	58.12	ND	2.0		ND	4.8	
Vinyl chloride	75-01-4	62.50	ND	2.0		ND	5.1	
1,3-Butadiene	106-99-0	54.09	ND	2.0		ND	4.4	
Bromomethane	74-83-9	94.94	ND	2.0		ND	7.8	
Chloroethane	75-00-3	64.51	ND	2.0		ND	5.3	
Ethanol	64-17-5	46.07	70	10		130	19	
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	2.0		ND	8.7	
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	2.0		ND	11	
Isopropyl alcohol(2-Propanol)	67-63-0	60.09	26	5.0		63	12	
Freon 113(1,1,2-Trichlorotrifluoroethane)	76-13-1	187.4	ND	2.0		ND	15	
Acetone	67-64-1	58.08	150	2.0		350	4.8	
1,1-Dichloroethene	75-35-4	96.94	ND	2.0		ND	7.9	
Acetonitrile	75-05-8	41.05	ND	2.0		ND	3.4	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	3.0	2.0		9.0	6.1	
Bromoethane(Ethyl bromide)	74-96-4	109.0	ND	2.0		ND	8.9	
3-Chloropropene(Allyl chloride)	107-05-1	76.52	ND	2.0		ND	6.3	
Carbon disulfide	75-15-0	76.14	ND	2.0		ND	6.2	
Methylene chloride	75-09-2	84.93	3.1	2.0		11	6.9	
Acrylonitrile	107-13-1	53.08	ND	2.0		ND	4.3	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.15	ND	2.0		ND	7.2	
trans-1,2-Dichloroethene	156-60-5	96.94	ND	2.0		ND	7.9	
n-Hexane	110-54-3	86.18	ND	2.0		ND	7.0	
1,1-Dichloroethane	75-34-3	98.96	ND	2.0		ND	8.1	
Vinyl acetate	108-05-4	86.09	ND	2.0		ND	7.0	
2-Butanone(MEK)	78-93-3	72.11	10	2.0		31	5.9	
cis-1,2-Dichloroethene	156-59-2	96.94	ND	2.0		ND	7.9	
Ethyl acetate	141-78-6	88.11	ND	2.0		ND	7.2	
Chloroform	67-66-3	119.4	ND	2.0		ND	10	
Tetrahydrofuran	109-99-9	72.11	ND	2.0		ND	5.9	
1,1,1-Trichloroethane	71-55-6	133.4	ND	2.0		ND	11	
Cyclohexane	110-82-7	84.16	ND	2.0		ND	6.9	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.2	ND	2.0		ND	9.3	
Carbon tetrachloride	56-23-5	153.8	ND	2.0		ND	13	
n-Heptane	142-82-5	100.2	ND	2.0		ND	8.2	
1,2-Dichloroethane	107-06-2	98.96	ND	2.0		ND	8.1	
Benzene	71-43-2	78.11	ND	2.0		ND	6.4	
Trichloroethene	79-01-6	131.4	ND	2.0		ND	11	
1,2-Dichloropropane	78-87-5	113.0	ND	2.0		ND	9.2	
Methyl Methacrylate	80-62-6	100.1	ND	2.0		ND	8.2	
Bromodichloromethane	75-27-4	163.8	ND	2.0		ND	13	
1,4-Dioxane	123-91-1	88.11	ND	2.0		ND	7.2	

8 of 20

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EMSL ORDER ID: 492300463
EMSL CUSTOMER ID: ENVI54
EMSL SAMPLE ID: 492300463-0002
CUSTOMER SAMPLE ID: 1708230531-02

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA -
20081266.B20

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10742.D	JARL26	25 cc	10

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	85	2.0		350	8.2	
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	2.0		ND	9.1	
Toluene	108-88-3	92.14	ND	2.0		ND	7.5	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	2.0		ND	9.1	
1,1,2-Trichloroethane	79-00-5	133.4	ND	2.0		ND	11	
2-Hexanone(MBK)	591-78-6	100.2	ND	2.0		ND	8.2	
Tetrachloroethene	127-18-4	165.8	ND	2.0		ND	14	
Dibromochloromethane	124-48-1	208.3	ND	2.0		ND	17	
1,2-Dibromoethane	106-93-4	187.9	ND	2.0		ND	15	
Chlorobenzene	108-90-7	112.6	ND	2.0		ND	9.2	
Ethylbenzene	100-41-4	106.2	ND	2.0		ND	8.7	
Xylene (p,m)	1330-20-7	106.2	ND	4.0		ND	17	
Xylene (Ortho)	95-47-6	106.2	ND	2.0		ND	8.7	
Styrene	100-42-5	104.1	ND	2.0		ND	8.5	
Isopropylbenzene (cumene)	98-82-8	120.2	ND	2.0		ND	10	
Bromoform	75-25-2	252.7	ND	2.0		ND	21	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	2.0		ND	14	
4-Ethyltoluene	622-96-8	120.2	ND	2.0		ND	10	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	2.0		ND	10	
2-Chlorotoluene	95-49-8	126.6	ND	2.0		ND	10	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	2.0		ND	10	
1,3-Dichlorobenzene	541-73-1	147.0	ND	2.0		ND	12	
1,4-Dichlorobenzene	106-46-7	147.0	ND	2.0		ND	12	
Benzyl chloride	100-44-7	126.6	ND	2.0		ND	10	
1,2-Dichlorobenzene	95-50-1	147.0	ND	2.0		ND	12	
1,2,4-Trichlorobenzene	120-82-1	181.4	ND	2.0		ND	15	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	2.0		ND	21	
Naphthalene	91-20-3	128.2	ND	2.0		ND	10	
Total Target Compound Concentrations:			360	ppbv		1000	ug/m3	

Surrogate

4-Bromofluorobenzene

Result

10

Spike

10

Recovery

100%

Qualifier Definitions**ND = Non Detect**

B = Compound also found in method blank.

E= Estimated concentration exceeding upper calibration range.

D= Result reported from diluted analysis.

J= Concentration estimated between Reporting Limit and MDL.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

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EMSL ORDER ID: 492300463

EMSL CUSTOMER ID: ENVI54

EMSL SAMPLE ID: 492300463-0002

CUSTOMER SAMPLE ID: 1708230531-02

Attention: Wendy Tram
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA -
 20081266.B20

Phone: 860-646-2469
Email: wtram@fando.com

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10742.D	JARL26	25 cc	10

Tentatively Identified Compound Results Summary

[illegible]

Qualifier Definitions

(1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.

B = Compound also found in method blank.

J= Estimated value based on a 1:1 response to internal standard.

N= Presumptive evidence of compound based on library match.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

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Manchester, CT 06040

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Email: wtram@fando.com

EMSL ORDER ID: 492300463
EMSL CUSTOMER ID: ENVI54
EMSL SAMPLE ID: 492300463-0002
CUSTOMER SAMPLE ID: 1708230531-02

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA -
20081266.B20

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10742.D	JARL26	25 cc	10

Total Volatile Organic Compounds (TVOC) Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
Propylene	115-07-1	42.08	10	5.0		18	8.6	
Ethanol	64-17-5	46.07	70	10		130	19	
Isopropyl alcohol(2-Propanol)	67-63-0	60.09	26	5.0		63	12	
Acetone	67-64-1	58.08	150	2.0		350	4.8	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	3.0	2.0		9.0	6.1	
Methylene chloride	75-09-2	84.93	3.1	2.0		11	6.9	
2-Butanone(MEK)	78-93-3	72.11	10	2.0		31	5.9	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	85	2.0		350	8.2	
Total Target Compound Concentrations:			360	ppbv		1000	ug/m3	

Qualifier Definitions

B = Compound also found in method blank.
E= Estimated concentration exceeding upper calibration range.
D= Result reported from diluted analysis.
J= Concentration estimated between Reporting Limit and MDL.

Tentatively Identified Compounds	CAS#	MW(1)	Result ppbv		Q	Result ug/m3	Retention Time	Comments
Carbonyl sulfide	000463-58-1	60	16		JN	40	5.101	
1-Propene, 2-methyl-	000115-11-7	56	73		JN	170	5.902	
Acetaldehyde	000075-07-0	44	28		JN	49	6.379	
unknown		92	46		JN	170	15.723	
Total TIC Concentrations:			160	ppbv		430	ug/m3	

Qualifier Definitions

(1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.
B = Compound also found in method blank.
J= Estimated value based on a 1:1 response to internal standard.
N= Presumptive evidence of compound based on library match.

Total Volatile Organic Compounds (TVOCs): 520 ppbv 1400 ug/m3

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EMSL ORDER ID: 492300463
EMSL CUSTOMER ID: ENVI54
EMSL SAMPLE ID: 492300463-0003
CUSTOMER SAMPLE ID: 1708230531-03

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA - 20081266.B20

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10743.D	JARL29	25 cc	10

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
Propylene	115-07-1	42.08	ND	5.0		ND	8.6	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	ND	2.0		ND	10	
Freon 114(1,2-Dichlorotetrafluoroethane)	76-14-2	170.9	ND	2.0		ND	14	
Chloromethane	74-87-3	50.49	ND	2.0		ND	4.1	
n-Butane	106-97-8	58.12	ND	2.0		ND	4.8	
Vinyl chloride	75-01-4	62.50	ND	2.0		ND	5.1	
1,3-Butadiene	106-99-0	54.09	ND	2.0		ND	4.4	
Bromomethane	74-83-9	94.94	ND	2.0		ND	7.8	
Chloroethane	75-00-3	64.51	ND	2.0		ND	5.3	
Ethanol	64-17-5	46.07	180	10		340	19	
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	2.0		ND	8.7	
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	2.0		ND	11	
Isopropyl alcohol(2-Propanol)	67-63-0	60.09	73	5.0		180	12	
Freon 113(1,1,2-Trichlorotrifluoroethane)	76-13-1	187.4	ND	2.0		ND	15	
Acetone	67-64-1	58.08	150	2.0		360	4.8	
1,1-Dichloroethene	75-35-4	96.94	ND	2.0		ND	7.9	
Acetonitrile	75-05-8	41.05	ND	2.0		ND	3.4	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	2.6	2.0		7.8	6.1	
Bromoethane(Ethyl bromide)	74-96-4	109.0	ND	2.0		ND	8.9	
3-Chloropropene(Allyl chloride)	107-05-1	76.52	ND	2.0		ND	6.3	
Carbon disulfide	75-15-0	76.14	ND	2.0		ND	6.2	
Methylene chloride	75-09-2	84.93	5.6	2.0		20	6.9	
Acrylonitrile	107-13-1	53.08	ND	2.0		ND	4.3	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.15	ND	2.0		ND	7.2	
trans-1,2-Dichloroethene	156-60-5	96.94	ND	2.0		ND	7.9	
n-Hexane	110-54-3	86.18	ND	2.0		ND	7.0	
1,1-Dichloroethane	75-34-3	98.96	ND	2.0		ND	8.1	
Vinyl acetate	108-05-4	86.09	ND	2.0		ND	7.0	
2-Butanone(MEK)	78-93-3	72.11	11	2.0		32	5.9	
cis-1,2-Dichloroethene	156-59-2	96.94	ND	2.0		ND	7.9	
Ethyl acetate	141-78-6	88.11	ND	2.0		ND	7.2	
Chloroform	67-66-3	119.4	ND	2.0		ND	10	
Tetrahydrofuran	109-99-9	72.11	ND	2.0		ND	5.9	
1,1,1-Trichloroethane	71-55-6	133.4	ND	2.0		ND	11	
Cyclohexane	110-82-7	84.16	ND	2.0		ND	6.9	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.2	ND	2.0		ND	9.3	
Carbon tetrachloride	56-23-5	153.8	ND	2.0		ND	13	
n-Heptane	142-82-5	100.2	ND	2.0		ND	8.2	
1,2-Dichloroethane	107-06-2	98.96	ND	2.0		ND	8.1	
Benzene	71-43-2	78.11	ND	2.0		ND	6.4	
Trichloroethene	79-01-6	131.4	ND	2.0		ND	11	
1,2-Dichloropropane	78-87-5	113.0	ND	2.0		ND	9.2	
Methyl Methacrylate	80-62-6	100.1	ND	2.0		ND	8.2	
Bromodichloromethane	75-27-4	163.8	ND	2.0		ND	13	
1,4-Dioxane	123-91-1	88.11	ND	2.0		ND	7.2	

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**EMSL ANALYTICAL, INC.**

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Attention: Wendy Tram
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146 Hartford Road
Manchester, CT 06040

Phone: 860-646-2469
Email: wtram@fando.com

EMSL ORDER ID: 492300463
EMSL CUSTOMER ID: ENVI54
EMSL SAMPLE ID: 492300463-0003
CUSTOMER SAMPLE ID: 1708230531-03

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA - 20081266.B20

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10743.D	JARL29	25 cc	10

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	93	2.0		380	8.2	
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	2.0		ND	9.1	
Toluene	108-88-3	92.14	ND	2.0		ND	7.5	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	2.0		ND	9.1	
1,1,2-Trichloroethane	79-00-5	133.4	ND	2.0		ND	11	
2-Hexanone(MBK)	591-78-6	100.2	ND	2.0		ND	8.2	
Tetrachloroethene	127-18-4	165.8	ND	2.0		ND	14	
Dibromochloromethane	124-48-1	208.3	ND	2.0		ND	17	
1,2-Dibromoethane	106-93-4	187.9	ND	2.0		ND	15	
Chlorobenzene	108-90-7	112.6	ND	2.0		ND	9.2	
Ethylbenzene	100-41-4	106.2	ND	2.0		ND	8.7	
Xylene (p,m)	1330-20-7	106.2	ND	4.0		ND	17	
Xylene (Ortho)	95-47-6	106.2	ND	2.0		ND	8.7	
Styrene	100-42-5	104.1	ND	2.0		ND	8.5	
Isopropylbenzene (cumene)	98-82-8	120.2	ND	2.0		ND	10	
Bromoform	75-25-2	252.7	ND	2.0		ND	21	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	2.0		ND	14	
4-Ethyltoluene	622-96-8	120.2	ND	2.0		ND	10	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	2.0		ND	10	
2-Chlorotoluene	95-49-8	126.6	ND	2.0		ND	10	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	2.0		ND	10	
1,3-Dichlorobenzene	541-73-1	147.0	ND	2.0		ND	12	
1,4-Dichlorobenzene	106-46-7	147.0	ND	2.0		ND	12	
Benzyl chloride	100-44-7	126.6	ND	2.0		ND	10	
1,2-Dichlorobenzene	95-50-1	147.0	ND	2.0		ND	12	
1,2,4-Trichlorobenzene	120-82-1	181.4	ND	2.0		ND	15	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	2.0		ND	21	
Naphthalene	91-20-3	128.2	ND	2.0		ND	10	
Total Target Compound Concentrations:			520	ppbv		1300	ug/m3	

Surrogate

4-Bromofluorobenzene

Result

10

Spike

10

Recovery

100%

Qualifier Definitions**ND = Non Detect**

B = Compound also found in method blank.

E= Estimated concentration exceeding upper calibration range.

D= Result reported from diluted analysis.

J= Concentration estimated between Reporting Limit and MDL.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

EMSL ANALYTICAL, INC.

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EMSL ORDER ID: 492300463

EMSL CUSTOMER ID: ENVI54

EMSL SAMPLE ID: 492300463-0003

CUSTOMER SAMPLE ID: 1708230531-03

Attention: Wendy Tram
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA -
 20081266.B20

Phone: 860-646-2469
Email: wtram@fando.com

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10743.D	JARL29	25 cc	10

Tentatively Identified Compound Results Summary

Tentatively Identified Compounds	CAS#	MW(1)	Result ppbv	Q	Result ug/m3	Retention Time	Comments
1-Propene, 2-methyl-	000115-11-7	56	29	JN	65	5.907	
Acetaldehyde	000075-07-0	44	16	JN	29	6.39	
unknown		92	39	JN	150	15.72	
Total TIC Concentrations:			84	ppbv	240	ug/m3	

Qualifier Definitions

(1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.

B = Compound also found in method blank.

J= Estimated value based on a 1:1 response to internal standard.

N= Presumptive evidence of compound based on library match.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

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Phone: 860-646-2469
Email: wtram@fando.com

EMSL ORDER ID: 492300463
EMSL CUSTOMER ID: ENVI54
EMSL SAMPLE ID: 492300463-0003
CUSTOMER SAMPLE ID: 1708230531-03

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA -
20081266.B20

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10743.D	JARL29	25 cc	10

Total Volatile Organic Compounds (TVOC) Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
Ethanol	64-17-5	46.07	180	10		340	19	
Isopropyl alcohol(2-Propanol)	67-63-0	60.09	73	5.0		180	12	
Acetone	67-64-1	58.08	150	2.0		360	4.8	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	2.6	2.0		7.8	6.1	
Methylene chloride	75-09-2	84.93	5.6	2.0		20	6.9	
2-Butanone(MEK)	78-93-3	72.11	11	2.0		32	5.9	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	93	2.0		380	8.2	
Total Target Compound Concentrations:			520	ppbv		1300	ug/m3	

Qualifier Definitions

B = Compound also found in method blank.
E = Estimated concentration exceeding upper calibration range.
D = Result reported from diluted analysis.
J = Concentration estimated between Reporting Limit and MDL.

Tentatively Identified Compounds	CAS#	MW(1)	Result ppbv		Q	Result ug/m3	Retention Time	Comments
1-Propene, 2-methyl-	000115-11-7	56	29		JN	65	5.907	
Acetaldehyde	000075-07-0	44	16		JN	29	6.385	
unknown		92	39		JN	150	15.723	
Total TIC Concentrations:			84	ppbv		240	ug/m3	

Qualifier Definitions

(1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.
B = Compound also found in method blank.
J = Estimated value based on a 1:1 response to internal standard.
N = Presumptive evidence of compound based on library match.

Total Volatile Organic Compounds (TVOCs): **600 ppbv** **1500 ug/m3**

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Email: wtram@fando.com

EMSL ORDER ID: 492300463
EMSL CUSTOMER ID: ENVI54
EMSL SAMPLE ID: 492300463-000B
CUSTOMER SAMPLE ID: Lab Background

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA - 20081266.B20

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10740.D	JARL2	25 cc	10

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
Propylene	115-07-1	42.08	ND	5.0		ND	8.6	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	ND	2.0		ND	10	
Freon 114(1,2-Dichlorotetrafluoroethan	76-14-2	170.9	ND	2.0		ND	14	
Chloromethane	74-87-3	50.49	ND	2.0		ND	4.1	
n-Butane	106-97-8	58.12	2.8	2.0		6.7	4.8	
Vinyl chloride	75-01-4	62.50	ND	2.0		ND	5.1	
1,3-Butadiene	106-99-0	54.09	ND	2.0		ND	4.4	
Bromomethane	74-83-9	94.94	ND	2.0		ND	7.8	
Chloroethane	75-00-3	64.51	ND	2.0		ND	5.3	
Ethanol	64-17-5	46.07	490	10	E	930	19	
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	2.0		ND	8.7	
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	2.0		ND	11	
Isopropyl alcohol(2-Propanol)	67-63-0	60.09	82	5.0		200	12	
Freon 113(1,1,2-Trichlorotrifluoroethan	76-13-1	187.4	ND	2.0		ND	15	
Acetone	67-64-1	58.08	36	2.0		87	4.8	
1,1-Dichloroethene	75-35-4	96.94	ND	2.0		ND	7.9	
Acetonitrile	75-05-8	41.05	ND	2.0		ND	3.4	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	ND	2.0		ND	6.1	
Bromoethane(Ethyl bromide)	74-96-4	109.0	ND	2.0		ND	8.9	
3-Chloropropene(Allyl chloride)	107-05-1	76.52	ND	2.0		ND	6.3	
Carbon disulfide	75-15-0	76.14	ND	2.0		ND	6.2	
Methylene chloride	75-09-2	84.93	9.4	2.0		33	6.9	
Acrylonitrile	107-13-1	53.08	ND	2.0		ND	4.3	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.15	ND	2.0		ND	7.2	
trans-1,2-Dichloroethene	156-60-5	96.94	ND	2.0		ND	7.9	
n-Hexane	110-54-3	86.18	ND	2.0		ND	7.0	
1,1-Dichloroethane	75-34-3	98.96	ND	2.0		ND	8.1	
Vinyl acetate	108-05-4	86.09	ND	2.0		ND	7.0	
2-Butanone(MEK)	78-93-3	72.11	ND	2.0		ND	5.9	
cis-1,2-Dichloroethene	156-59-2	96.94	ND	2.0		ND	7.9	
Ethyl acetate	141-78-6	88.11	ND	2.0		ND	7.2	
Chloroform	67-66-3	119.4	ND	2.0		ND	10	
Tetrahydrofuran	109-99-9	72.11	ND	2.0		ND	5.9	
1,1,1-Trichloroethane	71-55-6	133.4	ND	2.0		ND	11	
Cyclohexane	110-82-7	84.16	ND	2.0		ND	6.9	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.2	ND	2.0		ND	9.3	
Carbon tetrachloride	56-23-5	153.8	ND	2.0		ND	13	
n-Heptane	142-82-5	100.2	ND	2.0		ND	8.2	
1,2-Dichloroethane	107-06-2	98.96	ND	2.0		ND	8.1	
Benzene	71-43-2	78.11	ND	2.0		ND	6.4	
Trichloroethene	79-01-6	131.4	ND	2.0		ND	11	
1,2-Dichloropropane	78-87-5	113.0	ND	2.0		ND	9.2	
Methyl Methacrylate	80-62-6	100.1	ND	2.0		ND	8.2	
Bromodichloromethane	75-27-4	163.8	ND	2.0		ND	13	
1,4-Dioxane	123-91-1	88.11	ND	2.0		ND	7.2	

16 of 20

**EMSL ANALYTICAL, INC.**

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Email: wtram@fando.com

EMSL ORDER ID: 492300463
EMSL CUSTOMER ID: ENVI54
EMSL SAMPLE ID: 492300463-000B
CUSTOMER SAMPLE ID: Lab Background

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA - 20081266.B20

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10740.D	JARL2	25 cc	10

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	ND	2.0		ND	8.2	
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	2.0		ND	9.1	
Toluene	108-88-3	92.14	4.6	2.0		18	7.5	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	2.0		ND	9.1	
1,1,2-Trichloroethane	79-00-5	133.4	ND	2.0		ND	11	
2-Hexanone(MBK)	591-78-6	100.2	ND	2.0		ND	8.2	
Tetrachloroethene	127-18-4	165.8	ND	2.0		ND	14	
Dibromochloromethane	124-48-1	208.3	ND	2.0		ND	17	
1,2-Dibromoethane	106-93-4	187.9	ND	2.0		ND	15	
Chlorobenzene	108-90-7	112.6	ND	2.0		ND	9.2	
Ethylbenzene	100-41-4	106.2	ND	2.0		ND	8.7	
Xylene (p,m)	1330-20-7	106.2	ND	4.0		ND	17	
Xylene (Ortho)	95-47-6	106.2	ND	2.0		ND	8.7	
Styrene	100-42-5	104.1	ND	2.0		ND	8.5	
Isopropylbenzene (cumene)	98-82-8	120.2	ND	2.0		ND	10	
Bromoform	75-25-2	252.7	ND	2.0		ND	21	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	2.0		ND	14	
4-Ethyltoluene	622-96-8	120.2	ND	2.0		ND	10	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	2.0		ND	10	
2-Chlorotoluene	95-49-8	126.6	ND	2.0		ND	10	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	2.0		ND	10	
1,3-Dichlorobenzene	541-73-1	147.0	ND	2.0		ND	12	
1,4-Dichlorobenzene	106-46-7	147.0	ND	2.0		ND	12	
Benzyl chloride	100-44-7	126.6	ND	2.0		ND	10	
1,2-Dichlorobenzene	95-50-1	147.0	ND	2.0		ND	12	
1,2,4-Trichlorobenzene	120-82-1	181.4	ND	2.0		ND	15	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	2.0		ND	21	
Naphthalene	91-20-3	128.2	ND	2.0		ND	10	
Total Target Compound Concentrations:			620	ppbv		1300	ug/m3	

Surrogate

4-Bromofluorobenzene

Result

10

Spike

10

Recovery

100%

Qualifier Definitions**ND = Non Detect**

B = Compound also found in method blank.

E= Estimated concentration exceeding upper calibration range.

D= Result reported from diluted analysis.

J= Concentration estimated between Reporting Limit and MDL.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

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EMSL ORDER ID: 492300463

EMSL CUSTOMER ID: ENVI54

EMSL SAMPLE ID: 492300463-000B

CUSTOMER SAMPLE ID: Lab Background

Attention: Wendy Tram
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA -
 20081266.B20

Phone: 860-646-2469
Email: wtram@fando.com

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10740.D	JARL2	25 cc	10

Tentatively Identified Compound Results Summary

[illegible]

Qualifier Definitions

(1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.

B = Compound also found in method blank.

J= Estimated value based on a 1:1 response to internal standard.

N= Presumptive evidence of compound based on library match.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

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Attention: Wendy Tram
Fuss & O'Neill, Inc.
146 Hartford Road
Manchester, CT 06040

Phone: 860-646-2469
Email: wtram@fando.com

EMSL ORDER ID: 492300463
EMSL CUSTOMER ID: ENVI54
EMSL SAMPLE ID: 492300463-000B
CUSTOMER SAMPLE ID: Lab Background

Customer PO: 170820081266
EMSL Project ID:
Project Name: Needham Crumb Rubber, Needham, MA -
20081266.B20

Collected:
Received: 06/01/2023 09:00
Analyzed: See Results
Reported: 6/15/2023

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	06/15/2023	CP	y10740.D	JARL2	25 cc	10

Total Volatile Organic Compounds (TVOC) Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
n-Butane	106-97-8	58.12	2.8	2.0		6.7	4.8	
Ethanol	64-17-5	46.07	490	10	E	930	19	
Isopropyl alcohol(2-Propanol)	67-63-0	60.09	82	5.0		200	12	
Acetone	67-64-1	58.08	36	2.0		87	4.8	
Methylene chloride	75-09-2	84.93	9.4	2.0		33	6.9	
Toluene	108-88-3	92.14	4.6	2.0		18	7.5	
Total Target Compound Concentrations:			620	ppbv		1300	ug/m3	

Qualifier Definitions

B = Compound also found in method blank.
E= Estimated concentration exceeding upper calibration range.
D= Result reported from diluted analysis.
J= Concentration estimated between Reporting Limit and MDL.

Tentatively Identified Compounds	CAS#	MW(1)	Result ppbv	Q	Result ug/m3	Retention Time	Comments
Total TIC Concentrations:			0.0	ppbv	0.0	ug/m3	

Qualifier Definitions

(1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.
B = Compound also found in method blank.
J= Estimated value based on a 1:1 response to internal standard.
N= Presumptive evidence of compound based on library match.

Total Volatile Organic Compounds (TVOCs): 620 ppbv 1300 ug/m3

**FUSS & O'NEILL**

(860) 646-2469 • www.FandO.com

☐ 146 Hartford Road, Manchester, CT 06040☐ 56 Quarry Road, Trumbull, CT 06611☐ 1419 Richland Street, Columbia, SC 29201☐ 78 Interstate Drive, West Springfield, MA 01089☒ 108 Myrtle Street, #502, North Quincy, MA 02171☐ 317 Iron Horse Way, Suite 204, Providence, RI 02908☐ 80 Washington Street, Suite 301, Poughkeepsie, NY☐ Other _____**CHAIN-OF-CUSTODY RECORD****41795**☐ 24-Hour* ☐ 72-Hour* ☐ Other _____ (days)
☐ 48-Hour* ☒ Standard (____ days) *Surcharge Applies

PROJECT NAME

PROJECT LOCATION

PROJECT NUMBER

LABORATORY

Needham Crumb Rubber

Needham, MA

20081266.B20

EMSL (NJ)

REPORT TO: Wendy Tramm wtramm@fandco.com

INVOICE TO: " " " "

P.O. No.: 170820081266.B20

Sampler's Signature: *[Signature]* Date: 5/31/23

Source Codes:

MW=Monitoring Well

PW=Potable Water

T=Treatment Facility

S=Soil

B=Sediment

SW=Surface Water

ST=Stormwater

W=Waste

A=Air

C=Concrete

X=Other

Aqueous CR=Crumb Rubber

Analysis Request

Containers

Item No.	Transfer Check				Sample Number	Source Code	Date Sampled	Time Sampled
	1	2	3	4				
1	X				1708230531-01	CR	5/31/23	1015
2	X				1708230531-02	CR	5/31/23	1050
3	X				1708230531-03	CR	5/31/23	1130
4	X				1708230531-FB	X	5/31/23	1145

Full VOC and TICS list by TO-15 Metals (arsenic, cadmium, chromium, lead, iron, manganese, mercury, selenium, & zinc) by 6/10/7470 Soil VOA Vial ☐ methanol Soil VOA Vial ☐ water ☐ Na₂SO₄ Glass Soil Container (4) oz Other: Water VOA Vial ☐ As is ☐ HCl Glass Amber Plastic - As is ☐ 250 ml ☐ As is ☐ H₂SO₄ Plastic - H₂SO₄ ☐ 250 ml ☐ 500 ☐ 1000 ml Plastic - HNO₃ ☐ 250 ml ☐ 500 ml Plastic - NaOH, 250 ml									
Comments									
Brack									
Founders									
Memorial									

Transfer Number	Relinquished By	Accepted By	Date	Time	Charge Exceptions: ☐ CT Tax Exempt ☐ QA/QC ☐ Other _____ _____ Duplicates _____ Blanks (Item Nos: _____)
1	Ethan Karcawicz	<i>[Signature]</i> FX	6/1/23	9 ^{am}	Reporting and Detection Limit Requirements: ☐ RCP Deliverables ☒ MCP CAM Cert.
2		<i>[Signature]</i>	6/1/23	9 ^{am}	
3		<i>[Signature]</i> Am 104	6/5/23	1044	Additional Comments:
4					

**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax: 856-786-5974
EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

June 22, 2023

Wendy Tram
Fuss & O'Neill, Inc. [ENVI54]
146 Hartford Road
Manchester, CT 06040

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 6/1/2023. The results are tabulated on the attached pages for the following client designated project:

Needham Crumb Rubber Needham, MA

The reference number for these samples is EMSL Order #: AB56400 . Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact the lab at 856-858-4800.

Owen McKenna Laboratory Manager or other approved signatory

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**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Sample Condition on Receipt**Cooler ID: Default Cooler****Temperature: 19.6 °C**

Custody Seals	Y
Containers Intact	Y
COC/Labels Agree	Y
Preservation Confirmed	Y

**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax: 856-786-5974
EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
Fuss & O'Neill, Inc. [ENVI54]
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Manchester, CT 06040
(860) 646-2469
wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Samples in this Report

Lab ID	Sample	Matrix	Qualifiers	Date Sampled	Date Received
AB56400-01	1708230521-01	Solid		05/31/2023	06/01/2023
AB56400-02	1708230521-02	Solid		05/31/2023	06/01/2023
AB56400-03	1708230521-03	Solid		05/31/2023	06/01/2023

**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

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 Manchester, CT 06040
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 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

These are VOC
 solids results. Refer
 to other lab report
 for VOC vapor
 results.

Positive Hits Summary

Lab ID	Client ID					Sampled
AB56400-01	1708230521-01					05/31/23 10:15
Method	Analyte	Result	Qualifier	Unit	Analyzed	
SW 846-8260D	Hexane	490		µg/Kg	06/12/2023	16:03
SW 846-8260D	Methyl cyclohexane	0.0		µg/Kg	06/12/2023	15:36
SW 846-8260D	Tentatively Identified Compounds	0.0		µg/L	06/14/2023	16:21
SW 846-8260D	unknown (01)	252		µg/L	06/14/2023	16:21
SW 846-8260D	unknown (02)	220		µg/L	06/14/2023	16:21
SW 846-8260D	Methyl Acetate	23		µg/Kg	06/12/2023	16:03
SW 846-8260D	Methylene Chloride	7.5		µg/Kg	06/12/2023	16:03
SW 846-8260D	4-Methyl-2-pentanone	16		µg/Kg	06/12/2023	16:03
SW 846-8260D	Toluene	730		µg/Kg	06/14/2023	16:21
SW 846-8260D	Xylenes, Total	0.0		µg/Kg	06/12/2023	15:36
SM 2540 G 18th Edition	% Solids	100	HT1	%	06/15/2023	15:56
Lab ID	Client ID					Sampled
AB56400-02	1708230521-02					05/31/23 10:50
Method	Analyte	Result	Qualifier	Unit	Analyzed	
SW 846-8260D	Hexane	610		µg/Kg	06/12/2023	16:58
SW 846-8260D	Methyl cyclohexane	0.0		µg/Kg	06/12/2023	16:31
SW 846-8260D	Acetone	1800	HT	µg/Kg	06/15/2023	15:24
SW 846-8260D	Tentatively Identified Compounds	0.0		µg/L	06/14/2023	16:48
SW 846-8260D	unknown (01)	256		µg/L	06/14/2023	16:48
SW 846-8260D	unknown (02)	223		µg/L	06/14/2023	16:48
SW 846-8260D	Unknown (03)	256		µg/L	06/14/2023	16:48
SW 846-8260D	Methyl Acetate	22		µg/Kg	06/12/2023	16:58
SW 846-8260D	Methylene Chloride	8.7		µg/Kg	06/12/2023	16:58
SW 846-8260D	4-Methyl-2-pentanone	11		µg/Kg	06/12/2023	16:58
SW 846-8260D	Toluene	1000		µg/Kg	06/14/2023	16:48
SW 846-8260D	Xylenes, Total	0.0		µg/Kg	06/12/2023	16:31
SM 2540 G 18th Edition	% Solids	100	HT1	%	06/15/2023	15:56
Lab ID	Client ID					Sampled
AB56400-03	1708230521-03					05/31/23 11:30
Method	Analyte	Result	Qualifier	Unit	Analyzed	
SW 846-8260D	Hexane	780		µg/Kg	06/12/2023	17:25
SW 846-8260D	Methyl cyclohexane	0.0		µg/Kg	06/12/2023	17:25
SW 846-8260D	Acetone	250	HT	µg/Kg	06/15/2023	15:51
SW 846-8260D	No TICs found	0.0		µg/L	06/14/2023	17:15
SW 846-8260D	Tentatively Identified Compounds	0.0		µg/L	06/14/2023	17:15

**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Positive Hits Summary (Continued)

Lab ID	Client ID					Sampled
AB56400-03	1708230521-03					05/31/23 11:30
Method	Analyte	Result	Qualifier	Unit	Analyzed	
SW 846-8260D	unknown (01)	251		µg/L	06/14/2023 17:15	
SW 846-8260D	unknown (02)	214		µg/L	06/14/2023 17:15	
SW 846-8260D	Methyl Acetate	12		µg/Kg	06/12/2023 17:52	
SW 846-8260D	Methylene Chloride	9.4		µg/Kg	06/12/2023 17:52	
SW 846-8260D	Toluene	1500		µg/Kg	06/14/2023 17:15	
SW 846-8260D	Xylenes, Total	0.0		µg/Kg	06/12/2023 17:25	
SM 2540 G 18th Edition	% Solids	99.7	HT1	%	06/15/2023 15:56	

**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
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 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Sample Results

Sample: 1708230521-01
AB56400-01 (Solid)

Analyte	Result	Q	DF	RL	Units	Prepared Date/Time	Analyzed Date/Time	Prep/Analyst Initials	Prep Method	Analytical Method
GCMS-VOA										
Tentatively Identified Compounds	0.0		1		µg/L	06/14/23 00:20	06/14/23 16:21	WF/WRF	SW846 5035A	SW 846-8260D
unknown (01)	252		1		µg/L	06/14/23 00:20	06/14/23 16:21	WF/WRF	SW846 5035A	SW 846-8260D
unknown (02)	220		1		µg/L	06/14/23 00:20	06/14/23 16:21	WF/WRF	SW846 5035A	SW 846-8260D
Hexane	490		1		µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Methyl cyclohexane	0.0		1		µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Acetone	ND		1	20	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Acetonitrile	ND		1	50	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Acrolein	ND		1	50	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Acrylonitrile	ND		1	10	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Benzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Bromobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Bromochloromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Bromodichloromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Bromoform	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Bromomethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
2-Butanone	ND		1	10	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
tert-Butyl Alcohol	ND		1	20	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Sec-butylbenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Tert-butylbenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
N-butylbenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Carbon Disulfide	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Carbon Tetrachloride	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Chlorobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Chloroethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
2-Chloroethyl Vinyl Ether	ND		1	10	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Chloroform	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Chloromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
4-Chlorotoluene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
2-Chlorotoluene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Cyclohexane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,2-Dibromo-3-chloropropane	ND		1	10	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Dibromochloromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,2-Dibromoethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Dibromomethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Trans-1,4-dichloro-2-butene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,4-Dichlorobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,3-Dichlorobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,2-Dichlorobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Dichlorodifluoromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,2-Dichloroethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,1-Dichloroethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,1-Dichloroethene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Trans-1,2-dichloroethene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Cis-1,2-dichloroethene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,3-Dichloropropane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
2,2-Dichloropropane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,2-Dichloropropane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted."

**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400

LIMS Reference ID: AB56400

EMSL Customer ID: ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Sample Results

(Continued)

Sample: 1708230521-01 (Continued)**AB56400-01 (Solid)**

Analyte	Result	Q	DF	RL	Units	Prepared Date/Time	Analyzed Date/Time	Prep/Analyst Initials	Prep Method	Analytical Method
---------	--------	---	----	----	-------	--------------------	--------------------	-----------------------	-------------	-------------------

GCMS-VOA (Continued)**CS**

1,1-Dichloropropene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Cis-1,3-dichloropropene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Trans-1,3-dichloropropene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Ethyl Acetate	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Ethylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
n-Heptane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Hexachlorobutadiene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Hexachloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
n-Hexane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 15:36	WF/WRF	SW846 5035A	SW 846-8260D
2-Hexanone	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Iodomethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Isopropylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
4-Isopropyltoluene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Methyl Acetate	23	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Methylcyclohexane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Methylene Chloride	7.5	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
4-Methyl-2-pentanone	16	1	10	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Methyl-tert butyl ether	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Naphthalene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
N-propylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Styrene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,1,2,2-Tetrachloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,1,1,2-Tetrachloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Tetrachloroethene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Tetrahydrofuran	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Toluene	730	1	50	µg/Kg	06/14/23 00:20	06/14/23 16:21	WF/WRF	SW846 5035A	SW 846-8260D
1,2,4-Trichlorobenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,2,3-Trichlorobenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,1,2-Trichloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,1,1-Trichloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Trichloroethene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Trichlorofluoromethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,2,3-Trichloropropane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,3,5-Trimethylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
1,2,4-Trimethylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Vinyl Acetate	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Vinyl Chloride	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
o-xylene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
m&p-xylenes	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D
Xylenes, Total	0.0	1		µg/Kg	06/12/23 00:01	06/12/23 15:36	WF/WRF	SW846 5035A	SW 846-8260D

Surrogate(s)	Recovery	Q	Limits						
Surrogate: 4-Bromofluorobenzene	55%	S6	70-130	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D	
Surrogate: Dibromofluoromethane	108%		70-130	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D	
Surrogate: 1,2-Dichloroethane-d4	120%		70-130	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D	
Surrogate: Toluene-d8	70%		70-130	06/12/23 00:01	06/12/23 16:03	WF/WRF	SW846 5035A	SW 846-8260D	

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**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Sample Results**(Continued)****Sample: 1708230521-01 (Continued)****AB56400-01 (Solid)**

Analyte	Result	Q	DF	RL	Units	Prepared Date/Time	Analyzed Date/Time	Prep/Analyst Initials	Prep Method	Analytical Method
Wet										
% Solids	100	HT1	1	0.00	%	06/15/23 15:56	06/15/23 15:56	MM/mmazur	Wet	SM 2540 G 18th Edition

**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400

LIMS Reference ID: AB56400

EMSL Customer ID: ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Sample Results

(Continued)

Sample: 1708230521-02
AB56400-02 (Solid)

Analyte	Result	Q	DF	RL	Units	Prepared Date/Time	Analyzed Date/Time	Prep/Analyst Initials	Prep Method	Analytical Method
GCMS-VOA										
Tentatively Identified Compounds	0.0		1		µg/L	06/14/23 00:20	06/14/23 16:48	WF/WRF	SW846 5035A	SW 846-8260D
unknown (01)	256		1		µg/L	06/14/23 00:20	06/14/23 16:48	WF/WRF	SW846 5035A	SW 846-8260D
unknown (02)	223		1		µg/L	06/14/23 00:20	06/14/23 16:48	WF/WRF	SW846 5035A	SW 846-8260D
Unknown (03)	256		1		µg/L	06/14/23 00:20	06/14/23 16:48	WF/WRF	SW846 5035A	SW 846-8260D
Hexane	610		1		µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Methyl cyclohexane	0.0		1		µg/Kg	06/12/23 00:01	06/12/23 16:31	WF/WRF	SW846 5035A	SW 846-8260D
Acetone	1800	HT	10	200	µg/Kg	06/15/23 10:00	06/15/23 15:24	WF/WRF	SW846 5035A	SW 846-8260D
Acetonitrile	ND		1	50	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Acrolein	ND		1	50	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Acrylonitrile	ND		1	50	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Benzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Bromobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Bromochloromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Bromodichloromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Bromoform	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Bromomethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
2-Butanone	ND		1	10	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
tert-Butyl Alcohol	ND		1	20	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Sec-butylbenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Tert-butylbenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
N-butylbenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Carbon Disulfide	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Carbon Tetrachloride	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Chlorobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Chloroethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
2-Chloroethyl Vinyl Ether	ND		1	10	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Chloroform	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Chloromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
4-Chlorotoluene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
2-Chlorotoluene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Cyclohexane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
1,2-Dibromo-3-chloropropane	ND		1	10	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Dibromochloromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
1,2-Dibromoethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Dibromomethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Trans-1,4-dichloro-2-butene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
1,4-Dichlorobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
1,3-Dichlorobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
1,2-Dichlorobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Dichlorodifluoromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
1,2-Dichloroethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
1,1-Dichloroethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
1,1-Dichloroethene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Trans-1,2-dichloroethene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Cis-1,2-dichloroethene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
1,3-Dichloropropane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
2,2-Dichloropropane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D

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**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Sample Results**(Continued)****Sample: 1708230521-02 (Continued)****AB56400-02 (Solid)**

Analyte	Result	Q	DF	RL	Units	Prepared Date/Time	Analyzed Date/Time	Prep/Analyst Initials	Prep Method	Analytical Method
GCMS-VOA (Continued)										
1,2-Dichloropropane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
1,1-Dichloropropene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Cis-1,3-dichloropropene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Trans-1,3-dichloropropene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Ethyl Acetate	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Ethylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
n-Heptane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Hexachlorobutadiene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Hexachloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
n-Hexane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:31	WF/WRF	SW846 5035A	SW 846-8260D	
2-Hexanone	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Iodomethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Isopropylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
4-Isopropyltoluene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Methyl Acetate	22	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Methylcyclohexane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Methylene Chloride	8.7	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
4-Methyl-2-pentanone	11	1	10	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Methyl-tert butyl ether	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Naphthalene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
N-propylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Styrene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
1,1,2,2-Tetrachloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
1,1,1,2-Tetrachloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Tetrachloroethene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Tetrahydrofuran	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Toluene	1000	1	50	µg/Kg	06/14/23 00:20	06/14/23 16:48	WF/WRF	SW846 5035A	SW 846-8260D	
1,2,4-Trichlorobenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
1,2,3-Trichlorobenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
1,1,2-Trichloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
1,1,1-Trichloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Trichloroethene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Trichlorofluoromethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
1,2,3-Trichloropropane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
1,3,5-Trimethylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
1,2,4-Trimethylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Vinyl Acetate	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Vinyl Chloride	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
o-xylene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
m&p-xylenes	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D	
Xylenes, Total	0.0	1		µg/Kg	06/12/23 00:01	06/12/23 16:31	WF/WRF	SW846 5035A	SW 846-8260D	
Surrogate(s)	Recovery	Q	Limits							
Surrogate: 4-Bromofluorobenzene	55%	S6	70-130							
Surrogate: 4-Bromofluorobenzene	78%		70-130							
Surrogate: Dibromofluoromethane	107%		70-130							

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**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Sample Results**(Continued)****Sample: 1708230521-02 (Continued)****AB56400-02 (Solid)**

Analyte	Result	Q	DF	RL	Units	Prepared Date/Time	Analyzed Date/Time	Prep/Analyst Initials	Prep Method	Analytical Method
GCMS-VOA (Continued)										CS
Surrogate: Dibromofluoromethane	102%			70-130		06/15/23 10:00	06/15/23 15:24	WF/WRF	SW846 5035A	SW 846-8260D
Surrogate: 1,2-Dichloroethane-d4	121%			70-130		06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Surrogate: 1,2-Dichloroethane-d4	113%			70-130		06/15/23 10:00	06/15/23 15:24	WF/WRF	SW846 5035A	SW 846-8260D
Surrogate: Toluene-d8	69%	S6		70-130		06/12/23 00:01	06/12/23 16:58	WF/WRF	SW846 5035A	SW 846-8260D
Surrogate: Toluene-d8	92%			70-130		06/15/23 10:00	06/15/23 15:24	WF/WRF	SW846 5035A	SW 846-8260D
Wet										
% Solids	100	HT1	1	0.00	%	06/15/23 15:56	06/15/23 15:56	MM/mmazur	Wet	SM 2540 G 18th Edition

**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400

LIMS Reference ID: AB56400

EMSL Customer ID: ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Sample Results

(Continued)

Sample: 1708230521-03
AB56400-03 (Solid)

Analyte	Result	Q	DF	RL	Units	Prepared Date/Time	Analyzed Date/Time	Prep/Analyst Initials	Prep Method	Analytical Method
GCMS-VOA										
No TICs found	0.0		1		µg/L	06/14/23 00:20	06/14/23 17:15	WF/WRF	SW846 5035A	SW 846-8260D
Tentatively Identified Compounds	0.0		1		µg/L	06/14/23 00:20	06/14/23 17:15	WF/WRF	SW846 5035A	SW 846-8260D
unknown (01)	251		1		µg/L	06/14/23 00:20	06/14/23 17:15	WF/WRF	SW846 5035A	SW 846-8260D
unknown (02)	214		1		µg/L	06/14/23 00:20	06/14/23 17:15	WF/WRF	SW846 5035A	SW 846-8260D
Hexane	780		1		µg/Kg	06/12/23 00:01	06/12/23 17:25	WF/WRF	SW846 5035A	SW 846-8260D
Methyl cyclohexane	0.0		1		µg/Kg	06/12/23 00:01	06/12/23 17:25	WF/WRF	SW846 5035A	SW 846-8260D
Acetone	ND		1	20	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Acetone	250	HT	1	20	µg/Kg	06/15/23 10:00	06/15/23 15:51	WF/WRF	SW846 5035A	SW 846-8260D
Acetonitrile	ND		1	50	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Acrolein	ND		1	50	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Acrylonitrile	ND		1	10	µg/Kg	06/12/23 00:01	06/12/23 17:25	WF/WRF	SW846 5035A	SW 846-8260D
Benzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Bromobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Bromochloromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Bromodichloromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Bromoform	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Bromomethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
2-Butanone	ND		1	10	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
tert-Butyl Alcohol	ND		1	20	µg/Kg	06/12/23 00:01	06/12/23 17:25	WF/WRF	SW846 5035A	SW 846-8260D
Sec-butylbenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Tert-butylbenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
N-butylbenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Carbon Disulfide	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Carbon Tetrachloride	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Chlorobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Chloroethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
2-Chloroethyl Vinyl Ether	ND		1	10	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Chloroform	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Chloromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
4-Chlorotoluene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
2-Chlorotoluene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Cyclohexane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
1,2-Dibromo-3-chloropropane	ND		1	10	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Dibromochloromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
1,2-Dibromoethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Dibromomethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Trans-1,4-dichloro-2-butene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
1,4-Dichlorobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
1,3-Dichlorobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
1,2-Dichlorobenzene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Dichlorodifluoromethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
1,2-Dichloroethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
1,1-Dichloroethane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:25	WF/WRF	SW846 5035A	SW 846-8260D
1,1-Dichloroethene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Trans-1,2-dichloroethene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:25	WF/WRF	SW846 5035A	SW 846-8260D
Cis-1,2-dichloroethene	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
1,3-Dichloropropane	ND		1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D

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**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400

LIMS Reference ID: AB56400

EMSL Customer ID: ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320
EMSL Sales Rep: Jeromy Bish
Received: 06/01/2023 09:00
Reported: 06/22/2023 18:35

Sample Results

(Continued)

Sample: 1708230521-03 (Continued)
AB56400-03 (Solid)

Analyte	Result	Q	DF	RL	Units	Prepared Date/Time	Analyzed Date/Time	Prep/Analyst Initials	Prep Method	Analytical Method
GCMS-VOA (Continued)										
2,2-Dichloropropane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
1,2-Dichloropropane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
1,1-Dichloropropene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Cis-1,3-dichloropropene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Trans-1,3-dichloropropene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Ethyl Acetate	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Ethylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
n-Heptane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Hexachlorobutadiene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Hexachloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
n-Hexane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:25	WF/WRF	SW846 5035A	SW 846-8260D	
2-Hexanone	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Iodomethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Isopropylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
4-Isopropyltoluene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Methyl Acetate	12	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Methylcyclohexane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Methylene Chloride	9.4	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
4-Methyl-2-pentanone	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Methyl-tert butyl ether	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:25	WF/WRF	SW846 5035A	SW 846-8260D	
Naphthalene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
N-propylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Styrene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
1,1,2,2-Tetrachloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
1,1,1,2-Tetrachloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Tetrachloroethene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Tetrahydrofuran	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Toluene	1500	1	50	µg/Kg	06/14/23 00:20	06/14/23 17:15	WF/WRF	SW846 5035A	SW 846-8260D	
1,2,4-Trichlorobenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
1,2,3-Trichlorobenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
1,1,2-Trichloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
1,1,1-Trichloroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Trichloroethene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Trichlorofluoromethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
1,2,3-Trichloropropane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
1,3,5-Trimethylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
1,2,4-Trimethylbenzene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Vinyl Acetate	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Vinyl Chloride	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
o-xylene	ND	1	5.0	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
m&p-xylenes	ND	1	10	µg/Kg	06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D	
Xylenes, Total	0.0	1		µg/Kg	06/12/23 00:01	06/12/23 17:25	WF/WRF	SW846 5035A	SW 846-8260D	
Surrogate(s)	Recovery	Q	Limits							
Surrogate: 4-Bromofluorobenzene	65%	S6	70-130							
Surrogate: Dibromofluoromethane	107%		70-130							

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Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Sample Results**(Continued)****Sample: 1708230521-03 (Continued)****AB56400-03 (Solid)**

Analyte	Result	Q	DF	RL	Units	Prepared Date/Time	Analyzed Date/Time	Prep/Analyst Initials	Prep Method	Analytical Method
GCMS-VOA (Continued)										CS
Surrogate: 1,2-Dichloroethane-d4	123%			70-130		06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Surrogate: Toluene-d8	75%			70-130		06/12/23 00:01	06/12/23 17:52	WF/WRF	SW846 5035A	SW 846-8260D
Wet										
% Solids	99.7	HT1	1	0.00	%	06/15/23 15:56	06/15/23 15:56	MM/mmazur	Wet	SM 2540 G 18th Edition

**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Quality Control**GCMS-VOA**

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0193 - SW846 5035A**Blank (BBF0193-BLK1)**

Prepared & Analyzed: 6/12/2023

Methyl cyclohexane	0.00		µg/Kg
Hexane	0.00		µg/Kg
Acetone	ND	20	µg/Kg
Acetonitrile	ND	50	µg/Kg
Acrolein	ND	50	µg/Kg
Acrylonitrile	ND	10	µg/Kg
Benzene	ND	5.0	µg/Kg
Bromobenzene	ND	5.0	µg/Kg
Bromochloromethane	ND	5.0	µg/Kg
Bromodichloromethane	ND	5.0	µg/Kg
Bromoform	ND	5.0	µg/Kg
Bromomethane	ND	5.0	µg/Kg
2-Butanone	ND	10	µg/Kg
tert-Butyl Alcohol	ND	20	µg/Kg
Sec-butylbenzene	ND	5.0	µg/Kg
Tert-butylbenzene	ND	5.0	µg/Kg
N-butylbenzene	ND	5.0	µg/Kg
Carbon Disulfide	ND	5.0	µg/Kg
Carbon Tetrachloride	ND	5.0	µg/Kg
Chlorobenzene	ND	5.0	µg/Kg
Chloroethane	ND	5.0	µg/Kg
2-Chloroethyl Vinyl Ether	ND	10	µg/Kg
Chloroform	ND	5.0	µg/Kg
Chloromethane	ND	5.0	µg/Kg
4-Chlorotoluene	ND	5.0	µg/Kg
2-Chlorotoluene	ND	5.0	µg/Kg
Cyclohexane	ND	5.0	µg/Kg
1,2-Dibromo-3-chloropropane	ND	10	µg/Kg
Dibromochloromethane	ND	5.0	µg/Kg
1,2-Dibromoethane	ND	5.0	µg/Kg
Dibromomethane	ND	5.0	µg/Kg
Trans-1,4-dichloro-2-butene	ND	5.0	µg/Kg
1,4-Dichlorobenzene	ND	5.0	µg/Kg
1,3-Dichlorobenzene	ND	5.0	µg/Kg
1,2-Dichlorobenzene	ND	5.0	µg/Kg
Dichlorodifluoromethane	ND	5.0	µg/Kg
1,2-Dichloroethane	ND	5.0	µg/Kg
1,1-Dichloroethane	ND	5.0	µg/Kg
1,1-Dichloroethene	ND	5.0	µg/Kg
Trans-1,2-dichloroethene	ND	5.0	µg/Kg
Cis-1,2-dichloroethene	ND	5.0	µg/Kg
1,3-Dichloropropane	ND	5.0	µg/Kg
2,2-Dichloropropane	ND	5.0	µg/Kg
1,2-Dichloropropane	ND	5.0	µg/Kg

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 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

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 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
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 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

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Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0193 - SW846 5035A (Continued)**Blank (BBF0193-BLK1)**

Prepared & Analyzed: 6/12/2023

1,1-Dichloropropene	ND	5.0	µg/Kg
Cis-1,3-dichloropropene	ND	5.0	µg/Kg
Trans-1,3-dichloropropene	ND	5.0	µg/Kg
Ethyl Acetate	ND	10	µg/Kg
Ethylbenzene	ND	5.0	µg/Kg
n-Heptane	ND	5.0	µg/Kg
Hexachlorobutadiene	ND	5.0	µg/Kg
Hexachloroethane	ND	5.0	µg/Kg
n-Hexane	ND	5.0	µg/Kg
2-Hexanone	ND	10	µg/Kg
Iodomethane	ND	5.0	µg/Kg
Isopropylbenzene	ND	5.0	µg/Kg
4-Isopropyltoluene	ND	5.0	µg/Kg
Methyl Acetate	ND	5.0	µg/Kg
Methylcyclohexane	ND	5.0	µg/Kg
Methylene Chloride	ND	5.0	µg/Kg
4-Methyl-2-pentanone	ND	10	µg/Kg
Methyl-tert butyl ether	ND	5.0	µg/Kg
Naphthalene	ND	5.0	µg/Kg
N-propylbenzene	ND	5.0	µg/Kg
Styrene	ND	5.0	µg/Kg
1,1,2,2-Tetrachloroethane	ND	5.0	µg/Kg
1,1,1,2-Tetrachloroethane	ND	5.0	µg/Kg
Tetrachloroethene	ND	5.0	µg/Kg
Tetrahydrofuran	ND	10	µg/Kg
Toluene	ND	5.0	µg/Kg
1,2,4-Trichlorobenzene	ND	5.0	µg/Kg
1,2,3-Trichlorobenzene	ND	5.0	µg/Kg
1,1,2-Trichloroethane	ND	5.0	µg/Kg
1,1,1-Trichloroethane	ND	5.0	µg/Kg
Trichloroethene	ND	5.0	µg/Kg
Trichlorofluoromethane	ND	5.0	µg/Kg
1,2,3-Trichloropropane	ND	5.0	µg/Kg
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	5.0	µg/Kg
1,3,5-Trimethylbenzene	ND	5.0	µg/Kg
1,2,4-Trimethylbenzene	ND	5.0	µg/Kg
Vinyl Acetate	ND	10	µg/Kg
Vinyl Chloride	ND	5.0	µg/Kg
o-xylene	ND	5.0	µg/Kg
m&p-xylenes	ND	10	µg/Kg
Xylenes, Total	0.00		µg/Kg

Surrogate(s)

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 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0193 - SW846 5035A (Continued)**Blank (BBF0193-BLK1)**

Prepared & Analyzed: 6/12/2023

Surrogate(s)

Surrogate: 4-Bromofluorobenzene	50.00	100	70-130
Surrogate: Dibromofluoromethane	50.00	105	70-130
Surrogate: 1,2-Dichloroethane-d4	50.00	106	70-130
Surrogate: Toluene-d8	50.00	104	70-130

Matrix Spike (BBF0193-MS1)**Source: AB56567-01**

Prepared & Analyzed: 6/12/2023

Acetone	98.3	20	µg/Kg	100.0	ND	98	10-235
Acetonitrile	394	50	µg/Kg	500.0	ND	79	70-130
Acrolein	106	50	µg/Kg	200.0	ND	53	10-220
Acrylonitrile	83.0	10	µg/Kg	100.0	ND	83	10-160
Benzene	43.6	5.0	µg/Kg	50.00	ND	87	29-149
Bromobenzene	41.4	5.0	µg/Kg	50.00	ND	83	10-141
Bromochloromethane	42.8	5.0	µg/Kg	50.00	ND	86	36-149
Bromodichloromethane	43.5	5.0	µg/Kg	50.00	ND	87	10-160
Bromoform	43.5	5.0	µg/Kg	50.00	ND	87	10-140
Bromomethane	45.2	5.0	µg/Kg	50.00	ND	90	11-167
2-Butanone	89.0	10	µg/Kg	100.0	ND	89	10-190
tert-Butyl Alcohol	170	20	µg/Kg	200.0	ND	85	10-195
Sec-butylbenzene	40.0	5.0	µg/Kg	50.00	ND	80	10-145
Tert-butylbenzene	41.0	5.0	µg/Kg	50.00	ND	82	10-151
N-butylbenzene	36.5	5.0	µg/Kg	50.00	ND	73	10-146
Carbon Disulfide	40.5	5.0	µg/Kg	50.00	ND	81	10-164
Carbon Tetrachloride	42.6	5.0	µg/Kg	50.00	ND	85	10-160
Chlorobenzene	41.9	5.0	µg/Kg	50.00	ND	84	13-143
Chloroethane	46.8	5.0	µg/Kg	50.00	ND	94	31-162
2-Chloroethyl Vinyl Ether	96.5	10	µg/Kg	100.0	ND	97	10-165
Chloroform	50.0	5.0	µg/Kg	50.00	ND	100	35-150
Chloromethane	45.4	5.0	µg/Kg	50.00	ND	91	27-152
4-Chlorotoluene	40.2	5.0	µg/Kg	50.00	ND	80	10-146
2-Chlorotoluene	41.3	5.0	µg/Kg	50.00	ND	83	10-142
Cyclohexane	44.3	5.0	µg/Kg	50.00	ND	89	70-130
1,2-Dibromo-3-chloropropane	45.9	10	µg/Kg	50.00	ND	92	10-155
Dibromochloromethane	44.9	5.0	µg/Kg	50.00	ND	90	10-153
1,2-Dibromoethane	45.7	5.0	µg/Kg	50.00	ND	91	72-129
Dibromomethane	43.6	5.0	µg/Kg	50.00	ND	87	36-147
Trans-1,4-dichloro-2-butene	86.6	5.0	µg/Kg	100.0	ND	87	10-151
1,4-Dichlorobenzene	38.6	5.0	µg/Kg	50.00	ND	77	10-138
1,3-Dichlorobenzene	38.6	5.0	µg/Kg	50.00	ND	77	10-139
1,2-Dichlorobenzene	39.1	5.0	µg/Kg	50.00	ND	78	10-142
Dichlorodifluoromethane	42.8	5.0	µg/Kg	50.00	ND	86	13-167
1,2-Dichloroethane	43.4	5.0	µg/Kg	50.00	ND	87	41-143

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 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0193 - SW846 5035A (Continued)**Matrix Spike (BBF0193-MS1)****Source: AB56567-01**

Prepared & Analyzed: 6/12/2023

1,1-Dichloroethane	42.0	5.0	µg/Kg	50.00	ND	84	35-151
1,1-Dichloroethene	42.6	5.0	µg/Kg	50.00	ND	85	14-173
Trans-1,2-dichloroethene	42.4	5.0	µg/Kg	50.00	ND	85	17-161
Cis-1,2-dichloroethene	41.2	5.0	µg/Kg	50.00	ND	82	31-148
1,3-Dichloropropane	46.4	5.0	µg/Kg	50.00	ND	93	30-144
2,2-Dichloropropane	37.5	5.0	µg/Kg	50.00	ND	75	11-155
1,2-Dichloropropane	44.1	5.0	µg/Kg	50.00	ND	88	34-148
1,1-Dichloropropene	43.8	5.0	µg/Kg	50.00	ND	88	10-158
Cis-1,3-dichloropropene	43.4	5.0	µg/Kg	50.00	ND	87	10-167
Trans-1,3-dichloropropene	43.1	5.0	µg/Kg	50.00	ND	86	10-153
Ethyl Acetate	52.7 M1	10	µg/Kg	150.0	ND	35	70-130
Ethylbenzene	42.0	5.0	µg/Kg	50.00	ND	84	10-159
n-Heptane	41.0	5.0	µg/Kg	50.00	ND		70-130
Hexachlorobutadiene	32.3	5.0	µg/Kg	50.00	ND	65	10-149
Hexachloroethane	37.9	5.0	µg/Kg	50.00	ND	76	10-170
n-Hexane	ND M1	5.0	µg/Kg	50.00	ND		70-130
2-Hexanone	123	10	µg/Kg	100.0	ND	123	10-165
Iodomethane	40.3	5.0	µg/Kg	50.00	ND	81	70-130
Isopropylbenzene	42.1	5.0	µg/Kg	50.00	ND	84	10-154
4-Isopropyltoluene	39.2	5.0	µg/Kg	50.00	ND	78	10-140
Methyl Acetate	186 M1	5.0	µg/Kg	100.0	ND	186	70-130
Methylcyclohexane	43.2	5.0	µg/Kg	50.00	ND	86	70-130
Methylene Chloride	42.2	5.0	µg/Kg	50.00	ND	84	35-147
4-Methyl-2-pentanone	105	10	µg/Kg	100.0	ND	105	14-151
Methyl-tert butyl ether	45.0	5.0	µg/Kg	50.00	ND	90	52-142
Naphthalene	42.8	5.0	µg/Kg	50.00	ND	86	10-154
N-propylbenzene	41.4	5.0	µg/Kg	50.00	ND	83	10-153
Styrene	41.7	5.0	µg/Kg	50.00	ND	83	10-144
1,1,2,2-Tetrachloroethane	44.1	5.0	µg/Kg	50.00	ND	88	10-156
1,1,1,2-Tetrachloroethane	44.0	5.0	µg/Kg	50.00	ND	88	10-159
Tetrachloroethene	42.5	5.0	µg/Kg	50.00	ND	85	10-155
Tetrahydrofuran	92.0	10	µg/Kg	100.0	ND	92	22-170
Toluene	42.9	5.0	µg/Kg	50.00	ND	86	14-151
1,2,4-Trichlorobenzene	32.8	5.0	µg/Kg	50.00	ND	66	10-136
1,2,3-Trichlorobenzene	35.0	5.0	µg/Kg	50.00	ND	70	10-138
1,1,2-Trichloroethane	46.3	5.0	µg/Kg	50.00	ND	93	10-162
1,1,1-Trichloroethane	43.1	5.0	µg/Kg	50.00	ND	86	19-156
Trichloroethene	45.0	5.0	µg/Kg	50.00	ND	90	10-185
Trichlorofluoromethane	45.8	5.0	µg/Kg	50.00	ND	92	13-163
1,2,3-Trichloropropane	47.1	5.0	µg/Kg	50.00	ND	94	10-149
1,1,2-Trichloro-1,2,2-trifluoroethane	42.2	5.0	µg/Kg	50.00	ND	84	10-166
1,3,5-Trimethylbenzene	40.7	5.0	µg/Kg	50.00	ND	81	10-148
1,2,4-Trimethylbenzene	40.3	5.0	µg/Kg	50.00	ND	81	10-184
Vinyl Acetate	3.27 M1	10	µg/Kg	100.0	ND	3	10-104

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Received: 06/01/2023 09:00
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Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0193 - SW846 5035A (Continued)**Matrix Spike (BBF0193-MS1)****Source: AB56567-01**

Prepared & Analyzed: 6/12/2023

Vinyl Chloride	45.5	5.0	µg/Kg	50.00	ND	91	10-198		
o-xylene	42.0	5.0	µg/Kg	50.00	ND	84	10-155		
m&p-xylenes	83.1	10	µg/Kg	100.0	ND	83	10-158		
Xylenes, Total	125		µg/Kg	150.0	0.00	83	70-130		

Surrogate(s)

Surrogate: 4-Bromofluorobenzene				50.00		101	70-130		
Surrogate: Dibromofluoromethane				50.00		99	70-130		
Surrogate: 1,2-Dichloroethane-d4				50.00		107	70-130		
Surrogate: Toluene-d8				50.00		100	70-130		

Matrix Spike Dup (BBF0193-MSD1)**Source: AB56567-01**

Prepared & Analyzed: 6/12/2023

Acetone	95.6	20	µg/Kg	100.0	ND	96	10-235	3	30
Acetonitrile	414	50	µg/Kg	500.0	ND	83	70-130	5	25
Acrolein	97.5	50	µg/Kg	200.0	ND	49	10-220	9	22
Acrylonitrile	84.1	10	µg/Kg	100.0	ND	84	10-160	1	30
Benzene	41.0	5.0	µg/Kg	50.00	ND	82	29-149	6	12
Bromobenzene	39.1	5.0	µg/Kg	50.00	ND	78	10-141	6	19
Bromochloromethane	42.0	5.0	µg/Kg	50.00	ND	84	36-149	2	11
Bromodichloromethane	40.6	5.0	µg/Kg	50.00	ND	81	10-160	7	17
Bromoform	41.0	5.0	µg/Kg	50.00	ND	82	10-140	6	19
Bromomethane	40.6	5.0	µg/Kg	50.00	ND	81	11-167	11	51
2-Butanone	89.3	10	µg/Kg	100.0	ND	89	10-190	0.4	25
tert-Butyl Alcohol	193	20	µg/Kg	200.0	ND	96	10-195	13	23
Sec-butylbenzene	36.3	5.0	µg/Kg	50.00	ND	73	10-145	10	20
Tert-butylbenzene	37.2	5.0	µg/Kg	50.00	ND	74	10-151	10	19
N-butylbenzene	34.0	5.0	µg/Kg	50.00	ND	68	10-146	7	23
Carbon Disulfide	37.7	5.0	µg/Kg	50.00	ND	75	10-164	7	27
Carbon Tetrachloride	38.3	5.0	µg/Kg	50.00	ND	77	10-160	11	25
Chlorobenzene	39.2	5.0	µg/Kg	50.00	ND	78	13-143	7	18
Chloroethane	42.7	5.0	µg/Kg	50.00	ND	85	31-162	9	13
2-Chloroethyl Vinyl Ether	96.8	10	µg/Kg	100.0	ND	97	10-165	0.2	15
Chloroform	49.2	5.0	µg/Kg	50.00	ND	98	35-150	2	11
Chloromethane	41.5	5.0	µg/Kg	50.00	ND	83	27-152	9	11
4-Chlorotoluene	37.5	5.0	µg/Kg	50.00	ND	75	10-146	7	21
2-Chlorotoluene	38.0	5.0	µg/Kg	50.00	ND	76	10-142	8	21
Cyclohexane	40.5	5.0	µg/Kg	50.00	ND	81	70-130	9	25
1,2-Dibromo-3-chloropropane	47.6	10	µg/Kg	50.00	ND	95	10-155	4	22
Dibromochloromethane	42.0	5.0	µg/Kg	50.00	ND	84	10-153	7	18
1,2-Dibromoethane	45.7	5.0	µg/Kg	50.00	ND	91	72-129	0.07	25
Dibromomethane	43.4	5.0	µg/Kg	50.00	ND	87	36-147	0.6	10
Trans-1,4-dichloro-2-butene	81.3	5.0	µg/Kg	100.0	ND	81	10-151	6	21
1,4-Dichlorobenzene	36.4	5.0	µg/Kg	50.00	ND	73	10-138	6	21

**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320
EMSL Sales Rep: Jeromy Bish
Received: 06/01/2023 09:00
Reported: 06/22/2023 18:35

Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0193 - SW846 5035A (Continued)**Matrix Spike Dup (BBF0193-MSD1)****Source: AB56567-01**

Prepared & Analyzed: 6/12/2023

1,3-Dichlorobenzene	36.2	5.0	µg/Kg	50.00	ND	72	10-139	6	21
1,2-Dichlorobenzene	37.7	5.0	µg/Kg	50.00	ND	75	10-142	4	20
Dichlorodifluoromethane	38.9	5.0	µg/Kg	50.00	ND	78	13-167	10	15
1,2-Dichloroethane	42.2	5.0	µg/Kg	50.00	ND	84	41-143	3	8
1,1-Dichloroethane	39.8	5.0	µg/Kg	50.00	ND	80	35-151	5	11
1,1-Dichloroethene	39.3	5.0	µg/Kg	50.00	ND	79	14-173	8	14
Trans-1,2-dichloroethene	39.4	5.0	µg/Kg	50.00	ND	79	17-161	7	10
Cis-1,2-dichloroethene	39.4	5.0	µg/Kg	50.00	ND	79	31-148	4	25
1,3-Dichloropropane	44.9	5.0	µg/Kg	50.00	ND	90	30-144	3	10
2,2-Dichloropropane	34.1	5.0	µg/Kg	50.00	ND	68	11-155	10	20
1,2-Dichloropropane	42.0	5.0	µg/Kg	50.00	ND	84	34-148	5	11
1,1-Dichloropropene	40.3	5.0	µg/Kg	50.00	ND	81	10-158	8	20
Cis-1,3-dichloropropene	41.4	5.0	µg/Kg	50.00	ND	83	10-167	5	17
Trans-1,3-dichloropropene	42.5	5.0	µg/Kg	50.00	ND	85	10-153	2	17
Ethyl Acetate	62.4 M1	10	µg/Kg	150.0	ND	42	70-130	17	25
Ethylbenzene	38.6	5.0	µg/Kg	50.00	ND	77	10-159	8	22
n-Heptane	35.1	5.0	µg/Kg	50.00	ND		70-130	15	25
Hexachlorobutadiene	28.3	5.0	µg/Kg	50.00	ND	57	10-149	13	26
Hexachloroethane	34.8	5.0	µg/Kg	50.00	ND	70	10-170	8	27
n-Hexane	ND M1	5.0	µg/Kg	50.00	ND		70-130		25
2-Hexanone	118	10	µg/Kg	100.0	ND	118	10-165	3	18
Iodomethane	39.5	5.0	µg/Kg	50.00	ND	79	70-130	2	25
Isopropylbenzene	38.5	5.0	µg/Kg	50.00	ND	77	10-154	9	23
4-Isopropyltoluene	35.9	5.0	µg/Kg	50.00	ND	72	10-140	9	22
Methyl Acetate	176 M1	5.0	µg/Kg	100.0	ND	176	70-130	6	25
Methylcyclohexane	38.2	5.0	µg/Kg	50.00	ND	76	70-130	12	25
Methylene Chloride	40.5	5.0	µg/Kg	50.00	ND	81	35-147	4	12
4-Methyl-2-pentanone	106	10	µg/Kg	100.0	ND	106	14-151	0.6	15
Methyl-tert butyl ether	45.3	5.0	µg/Kg	50.00	ND	91	52-142	0.9	7
Naphthalene	43.5	5.0	µg/Kg	50.00	ND	87	10-154	2	25
N-propylbenzene	37.5	5.0	µg/Kg	50.00	ND	75	10-153	10	23
Styrene	39.1	5.0	µg/Kg	50.00	ND	78	10-144	6	25
1,1,2,2-Tetrachloroethane	39.8	5.0	µg/Kg	50.00	ND	80	10-156	10	17
1,1,1,2-Tetrachloroethane	41.1	5.0	µg/Kg	50.00	ND	82	10-159	7	22
Tetrachloroethene	39.8	5.0	µg/Kg	50.00	ND	80	10-155	6	20
Tetrahydrofuran	91.4	10	µg/Kg	100.0	ND	91	22-170	0.7	15
Toluene	39.9	5.0	µg/Kg	50.00	ND	80	14-151	7	15
1,2,4-Trichlorobenzene	33.0	5.0	µg/Kg	50.00	ND	66	10-136	0.5	24
1,2,3-Trichlorobenzene	34.5	5.0	µg/Kg	50.00	ND	69	10-138	1	24
1,1,2-Trichloroethane	44.7	5.0	µg/Kg	50.00	ND	89	10-162	3	9
1,1,1-Trichloroethane	40.6	5.0	µg/Kg	50.00	ND	81	19-156	6	19
Trichloroethene	44.5	5.0	µg/Kg	50.00	ND	89	10-185	1	18
Trichlorofluoromethane	40.8	5.0	µg/Kg	50.00	ND	82	13-163	12	18
1,2,3-Trichloropropane	46.5	5.0	µg/Kg	50.00	ND	93	10-149	1	18

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**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0193 - SW846 5035A (Continued)**Matrix Spike Dup (BBF0193-MSD1)****Source: AB56567-01**

Prepared & Analyzed: 6/12/2023

1,1,2-Trichloro-1,2,2-trifluoroethane	38.1	5.0	µg/Kg	50.00	ND	76	10-166	10	25
1,3,5-Trimethylbenzene	37.5	5.0	µg/Kg	50.00	ND	75	10-148	8	23
1,2,4-Trimethylbenzene	37.5	5.0	µg/Kg	50.00	ND	75	10-184	7	23
Vinyl Acetate	3.85 M1	10	µg/Kg	100.0	ND	4	10-104	16	22
Vinyl Chloride	41.4	5.0	µg/Kg	50.00	ND	83	10-198	9	16
o-xylene	39.3	5.0	µg/Kg	50.00	ND	79	10-155	7	20
m&p-xylenes	76.3	10	µg/Kg	100.0	ND	76	10-158	9	21
Xylenes, Total	116		µg/Kg	150.0	0.00	77	70-130	8	25

Surrogate(s)

Surrogate: 4-Bromofluorobenzene	50.00	100	70-130
Surrogate: Dibromofluoromethane	50.00	98	70-130
Surrogate: 1,2-Dichloroethane-d4	50.00	108	70-130
Surrogate: Toluene-d8	50.00	100	70-130

Batch: BBF0260 - SW846 5035A**Blank (BBF0260-BLK1)**

Prepared & Analyzed: 6/14/2023

Acetone	ND	20	µg/Kg
unknown (02)	15.2		µg/L
unknown (01)	20.2		µg/L
Tentatively Identified Compounds	0.00		µg/L
Acetonitrile	ND	50	µg/Kg
Acrolein	ND	50	µg/Kg
Acrylonitrile	ND	10	µg/Kg
Benzene	ND	5.0	µg/Kg
Bromobenzene	ND	5.0	µg/Kg
Bromochloromethane	ND	5.0	µg/Kg
Bromodichloromethane	ND	5.0	µg/Kg
Bromoform	ND	5.0	µg/Kg
Bromomethane	ND	5.0	µg/Kg
2-Butanone	ND	10	µg/Kg
tert-Butyl Alcohol	ND	20	µg/Kg
Sec-butylbenzene	ND	5.0	µg/Kg
Tert-butylbenzene	ND	5.0	µg/Kg
N-butylbenzene	ND	5.0	µg/Kg
Carbon Disulfide	ND	5.0	µg/Kg
Carbon Tetrachloride	ND	5.0	µg/Kg
Chlorobenzene	ND	5.0	µg/Kg
Chloroethane	ND	5.0	µg/Kg
2-Chloroethyl Vinyl Ether	ND	10	µg/Kg
Chloroform	ND	5.0	µg/Kg
Chloromethane	ND	5.0	µg/Kg

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Project Name: Needham Crumb Rubber Needham, MA

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EMSL Sales Rep: Jeromy Bish

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Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0260 - SW846 5035A (Continued)**Blank (BBF0260-BLK1)**

Prepared & Analyzed: 6/14/2023

4-Chlorotoluene	ND	5.0	µg/Kg
2-Chlorotoluene	ND	5.0	µg/Kg
Cyclohexane	ND	5.0	µg/Kg
1,2-Dibromo-3-chloropropane	ND	10	µg/Kg
Dibromochloromethane	ND	5.0	µg/Kg
1,2-Dibromoethane	ND	5.0	µg/Kg
Dibromomethane	ND	5.0	µg/Kg
Trans-1,4-dichloro-2-butene	ND	5.0	µg/Kg
1,4-Dichlorobenzene	ND	5.0	µg/Kg
1,3-Dichlorobenzene	ND	5.0	µg/Kg
1,2-Dichlorobenzene	ND	5.0	µg/Kg
Dichlorodifluoromethane	ND	5.0	µg/Kg
1,2-Dichloroethane	ND	5.0	µg/Kg
1,1-Dichloroethane	ND	5.0	µg/Kg
1,1-Dichloroethene	ND	5.0	µg/Kg
Trans-1,2-dichloroethene	ND	5.0	µg/Kg
Cis-1,2-dichloroethene	ND	5.0	µg/Kg
1,3-Dichloropropane	ND	5.0	µg/Kg
2,2-Dichloropropane	ND	5.0	µg/Kg
1,2-Dichloropropane	ND	5.0	µg/Kg
1,1-Dichloropropene	ND	5.0	µg/Kg
Cis-1,3-dichloropropene	ND	5.0	µg/Kg
Trans-1,3-dichloropropene	ND	5.0	µg/Kg
Ethyl Acetate	ND	10	µg/Kg
Ethylbenzene	ND	5.0	µg/Kg
n-Heptane	ND	5.0	µg/Kg
Hexachlorobutadiene	ND	5.0	µg/Kg
Hexachloroethane	ND	5.0	µg/Kg
n-Hexane	ND	5.0	µg/Kg
2-Hexanone	ND	10	µg/Kg
Iodomethane	ND	5.0	µg/Kg
Isopropylbenzene	ND	5.0	µg/Kg
4-Isopropyltoluene	ND	5.0	µg/Kg
Methyl Acetate	ND	5.0	µg/Kg
Methylcyclohexane	ND	5.0	µg/Kg
Methylene Chloride	ND	5.0	µg/Kg
4-Methyl-2-pentanone	ND	10	µg/Kg
Methyl-tert butyl ether	ND	5.0	µg/Kg
Naphthalene	ND	5.0	µg/Kg
N-propylbenzene	ND	5.0	µg/Kg
Styrene	ND	5.0	µg/Kg
1,1,2,2-Tetrachloroethane	ND	5.0	µg/Kg
1,1,1,2-Tetrachloroethane	ND	5.0	µg/Kg
Tetrachloroethene	ND	5.0	µg/Kg

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 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

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Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0260 - SW846 5035A (Continued)**Blank (BBF0260-BLK1)**

Prepared & Analyzed: 6/14/2023

Tetrahydrofuran	ND	10	µg/Kg
Toluene	ND	5.0	µg/Kg
1,2,4-Trichlorobenzene	ND	5.0	µg/Kg
1,2,3-Trichlorobenzene	ND	5.0	µg/Kg
1,1,2-Trichloroethane	ND	5.0	µg/Kg
1,1,1-Trichloroethane	ND	5.0	µg/Kg
Trichloroethene	ND	5.0	µg/Kg
Trichlorofluoromethane	ND	5.0	µg/Kg
1,2,3-Trichloropropane	ND	5.0	µg/Kg
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	5.0	µg/Kg
1,3,5-Trimethylbenzene	ND	5.0	µg/Kg
1,2,4-Trimethylbenzene	ND	5.0	µg/Kg
Vinyl Acetate	ND	10	µg/Kg
Vinyl Chloride	ND	5.0	µg/Kg
o-xylene	ND	5.0	µg/Kg
m&p-xylenes	ND	10	µg/Kg
Xylenes, Total	0.0500		µg/Kg

Surrogate(s)

Surrogate: 4-Bromofluorobenzene	50.00	98	70-130
Surrogate: Dibromofluoromethane	50.00	103	70-130
Surrogate: 1,2-Dichloroethane-d4	50.00	108	70-130
Surrogate: Toluene-d8	50.00	104	70-130

LCS (BBF0260-BS1)

Prepared & Analyzed: 6/14/2023

Acetone	84.9	20	µg/Kg	100.0	85	29-158
Acetonitrile	461	50	µg/Kg	500.0	92	70-130
Acrolein	115	50	µg/Kg	200.0	58	29-150
Acrylonitrile	92.3	10	µg/Kg	100.0	92	51-152
Benzene	46.2	5.0	µg/Kg	50.00	92	69-126
Bromobenzene	45.6	5.0	µg/Kg	50.00	91	71-119
Bromochloromethane	45.1	5.0	µg/Kg	50.00	90	73-129
Bromodichloromethane	46.9	5.0	µg/Kg	50.00	94	63-138
Bromoform	47.5	5.0	µg/Kg	50.00	95	66-125
Bromomethane	49.0	5.0	µg/Kg	50.00	98	25-144
2-Butanone	86.2	10	µg/Kg	100.0	86	29-166
tert-Butyl Alcohol	182	20	µg/Kg	200.0	91	24-175
Sec-butylbenzene	47.0	5.0	µg/Kg	50.00	94	62-128
Tert-butylbenzene	46.6	5.0	µg/Kg	50.00	93	64-127
N-butylbenzene	46.7	5.0	µg/Kg	50.00	93	63-127
Carbon Disulfide	45.8	5.0	µg/Kg	50.00	92	59-138
Carbon Tetrachloride	47.4	5.0	µg/Kg	50.00	95	56-140
Chlorobenzene	45.9	5.0	µg/Kg	50.00	92	73-116

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 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

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EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

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Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0260 - SW846 5035A (Continued)**LCS (BBF0260-BS1)**

Prepared & Analyzed: 6/14/2023

Chloroethane	48.3	5.0	µg/Kg	50.00		97	58-140		
2-Chloroethyl Vinyl Ether	95.4	10	µg/Kg	100.0		95	38-166		
Chloroform	45.5	5.0	µg/Kg	50.00		91	63-133		
Chloromethane	46.6	5.0	µg/Kg	50.00		93	41-146		
4-Chlorotoluene	46.3	5.0	µg/Kg	50.00		93	56-135		
2-Chlorotoluene	46.5	5.0	µg/Kg	50.00		93	66-122		
Cyclohexane	47.2	5.0	µg/Kg	50.00		94	70-130		
1,2-Dibromo-3-chloropropane	45.9	10	µg/Kg	50.00		92	53-142		
Dibromochloromethane	47.5	5.0	µg/Kg	50.00		95	62-135		
1,2-Dibromoethane	45.6	5.0	µg/Kg	50.00		91	19-149		
Dibromomethane	45.6	5.0	µg/Kg	50.00		91	67-133		
Trans-1,4-dichloro-2-butene	95.0	5.0	µg/Kg	100.0		95	57-149		
1,4-Dichlorobenzene	45.7	5.0	µg/Kg	50.00		91	65-123		
1,3-Dichlorobenzene	45.8	5.0	µg/Kg	50.00		92	64-125		
1,2-Dichlorobenzene	44.6	5.0	µg/Kg	50.00		89	73-117		
Dichlorodifluoromethane	46.1	5.0	µg/Kg	50.00		92	38-147		
1,2-Dichloroethane	45.1	5.0	µg/Kg	50.00		90	55-137		
1,1-Dichloroethane	45.9	5.0	µg/Kg	50.00		92	50-141		
1,1-Dichloroethene	45.4	5.0	µg/Kg	50.00		91	60-135		
Trans-1,2-dichloroethene	45.7	5.0	µg/Kg	50.00		91	62-133		
Cis-1,2-dichloroethene	45.4	5.0	µg/Kg	50.00		91	71-128		
1,3-Dichloropropane	46.1	5.0	µg/Kg	50.00		92	69-129		
2,2-Dichloropropane	47.3	5.0	µg/Kg	50.00		95	48-148		
1,2-Dichloropropane	46.5	5.0	µg/Kg	50.00		93	67-132		
1,1-Dichloropropene	46.8	5.0	µg/Kg	50.00		94	62-134		
Cis-1,3-dichloropropene	48.4	5.0	µg/Kg	50.00		97	34-174		
Trans-1,3-dichloropropene	47.8	5.0	µg/Kg	50.00		96	62-138		
Ethyl Acetate	139	10	µg/Kg	150.0		93	70-130		
Ethylbenzene	46.3	5.0	µg/Kg	50.00		93	69-121		
n-Heptane	46.9	5.0	µg/Kg				70-130		
Hexachlorobutadiene	45.5	5.0	µg/Kg	50.00		91	62-128		
Hexachloroethane	47.0	5.0	µg/Kg	50.00		94	56-122		
n-Hexane	47.3	5.0	µg/Kg	50.00		95	70-130		
2-Hexanone	97.7	10	µg/Kg	100.0		98	43-159		
Iodomethane	46.8	5.0	µg/Kg	50.00		94	70-130		
Isopropylbenzene	46.8	5.0	µg/Kg	50.00		94	69-125		
4-Isopropyltoluene	46.8	5.0	µg/Kg	50.00		94	62-128		
Methyl Acetate	89.8	5.0	µg/Kg	100.0		90	70-130		
Methylcyclohexane	46.7	5.0	µg/Kg	50.00		93	70-130		
Methylene Chloride	45.0	5.0	µg/Kg	50.00		90	65-129		
4-Methyl-2-pentanone	93.7	10	µg/Kg	100.0		94	46-152		
Methyl-tert butyl ether	45.8	5.0	µg/Kg				70-131		
Naphthalene	47.4	5.0	µg/Kg	50.00		95	67-134		
N-propylbenzene	47.2	5.0	µg/Kg	50.00		94	63-127		

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 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0260 - SW846 5035A (Continued)**LCS (BBF0260-BS1)**

Prepared & Analyzed: 6/14/2023

Styrene	46.4	5.0	µg/Kg	50.00		93	76-120		
1,1,2,2-Tetrachloroethane	45.5	5.0	µg/Kg	50.00		91	67-126		
1,1,1,2-Tetrachloroethane	47.6	5.0	µg/Kg	50.00		95	70-120		
Tetrachloroethene	45.2	5.0	µg/Kg	50.00		90	67-128		
Tetrahydrofuran	90.7	10	µg/Kg	100.0		91	33-175		
Toluene	45.2	5.0	µg/Kg	50.00		90	67-127		
1,2,4-Trichlorobenzene	46.2	5.0	µg/Kg	50.00		92	69-125		
1,2,3-Trichlorobenzene	45.4	5.0	µg/Kg	50.00		91	70-124		
1,1,2-Trichloroethane	45.5	5.0	µg/Kg	50.00		91	69-129		
1,1,1-Trichloroethane	47.3	5.0	µg/Kg	50.00		95	58-135		
Trichloroethene	46.7	5.0	µg/Kg	50.00		93	64-135		
Trichlorofluoromethane	47.5	5.0	µg/Kg	50.00		95	48-142		
1,2,3-Trichloropropane	46.0	5.0	µg/Kg	50.00		92	52-149		
1,1,2-Trichloro-1,2,2-trifluoroethane	45.2	5.0	µg/Kg	50.00		90	58-138		
1,3,5-Trimethylbenzene	46.8	5.0	µg/Kg	50.00		94	67-124		
1,2,4-Trimethylbenzene	47.0	5.0	µg/Kg	50.00		94	64-126		
Vinyl Acetate	46.9	10	µg/Kg	50.00		94	12-170		
Vinyl Chloride	46.8	5.0	µg/Kg	50.00		94	35-160		
o-xylene	46.5	5.0	µg/Kg	50.00		93	74-120		
m&p-xylenes	92.0	10	µg/Kg	100.0		92	69-117		
Xylenes, Total	139		µg/Kg				70-130		

Surrogate(s)

Surrogate: 4-Bromofluorobenzene	50.00	101	70-130
Surrogate: Dibromofluoromethane	50.00	99	70-130
Surrogate: 1,2-Dichloroethane-d4	50.00	102	70-130
Surrogate: Toluene-d8	50.00	101	70-130

LCS (BBF0260-BS2)

Prepared & Analyzed: 6/14/2023

Acetone	81.5	20	µg/Kg	100.0		81	29-158		
Acetonitrile	455	50	µg/Kg	500.0		91	70-130		
Acrolein	126	50	µg/Kg	200.0		63	29-150		
Acrylonitrile	91.9	10	µg/Kg	100.0		92	51-152		
Benzene	46.8	5.0	µg/Kg	50.00		94	69-126		
Bromobenzene	45.4	5.0	µg/Kg	50.00		91	71-119		
Bromochloromethane	45.7	5.0	µg/Kg	50.00		91	73-129		
Bromodichloromethane	47.0	5.0	µg/Kg	50.00		94	63-138		
Bromoform	45.6	5.0	µg/Kg	50.00		91	66-125		
Bromomethane	50.9	5.0	µg/Kg	50.00		102	25-144		
2-Butanone	81.7	10	µg/Kg	100.0		82	29-166		
tert-Butyl Alcohol	171	20	µg/Kg	200.0		86	24-175		
Sec-butylbenzene	46.9	5.0	µg/Kg	50.00		94	62-128		
Tert-butylbenzene	47.3	5.0	µg/Kg	50.00		95	64-127		

**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0260 - SW846 5035A (Continued)**LCS (BBF0260-BS2)**

Prepared & Analyzed: 6/14/2023

N-butylbenzene	46.1	5.0	µg/Kg	50.00		92	63-127		
Carbon Disulfide	44.8	5.0	µg/Kg	50.00		90	59-138		
Carbon Tetrachloride	46.0	5.0	µg/Kg	50.00		92	56-140		
Chlorobenzene	46.6	5.0	µg/Kg	50.00		93	73-116		
Chloroethane	50.4	5.0	µg/Kg	50.00		101	58-140		
2-Chloroethyl Vinyl Ether	95.4	10	µg/Kg	100.0		95	38-166		
Chloroform	46.3	5.0	µg/Kg	50.00		93	63-133		
Chloromethane	48.4	5.0	µg/Kg	50.00		97	41-146		
4-Chlorotoluene	46.6	5.0	µg/Kg	50.00		93	56-135		
2-Chlorotoluene	46.9	5.0	µg/Kg	50.00		94	66-122		
Cyclohexane	47.7	5.0	µg/Kg	50.00		95	70-130		
1,2-Dibromo-3-chloropropane	45.5	10	µg/Kg	50.00		91	53-142		
Dibromochloromethane	46.3	5.0	µg/Kg	50.00		93	62-135		
1,2-Dibromoethane	46.8	5.0	µg/Kg	50.00		94	19-149		
Dibromomethane	45.9	5.0	µg/Kg	50.00		92	67-133		
Trans-1,4-dichloro-2-butene	91.6	5.0	µg/Kg	100.0		92	57-149		
1,4-Dichlorobenzene	46.1	5.0	µg/Kg	50.00		92	65-123		
1,3-Dichlorobenzene	46.2	5.0	µg/Kg	50.00		92	64-125		
1,2-Dichlorobenzene	45.9	5.0	µg/Kg	50.00		92	73-117		
Dichlorodifluoromethane	44.7	5.0	µg/Kg	50.00		89	38-147		
1,2-Dichloroethane	45.7	5.0	µg/Kg	50.00		91	55-137		
1,1-Dichloroethane	46.1	5.0	µg/Kg	50.00		92	50-141		
1,1-Dichloroethene	44.3	5.0	µg/Kg	50.00		89	60-135		
Trans-1,2-dichloroethene	45.7	5.0	µg/Kg	50.00		91	62-133		
Cis-1,2-dichloroethene	45.3	5.0	µg/Kg	50.00		91	71-128		
1,3-Dichloropropane	47.1	5.0	µg/Kg	50.00		94	69-129		
2,2-Dichloropropane	43.6	5.0	µg/Kg	50.00		87	48-148		
1,2-Dichloropropane	47.0	5.0	µg/Kg	50.00		94	67-132		
1,1-Dichloropropene	46.9	5.0	µg/Kg	50.00		94	62-134		
Cis-1,3-dichloropropene	47.3	5.0	µg/Kg	50.00		95	34-174		
Trans-1,3-dichloropropene	46.2	5.0	µg/Kg	50.00		92	62-138		
Ethyl Acetate	138	10	µg/Kg	150.0		92	70-130		
Ethylbenzene	47.0	5.0	µg/Kg	50.00		94	69-121		
n-Heptane	47.4	5.0	µg/Kg				70-130		
Hexachlorobutadiene	44.5	5.0	µg/Kg	50.00		89	62-128		
Hexachloroethane	45.6	5.0	µg/Kg	50.00		91	56-122		
n-Hexane	47.3	5.0	µg/Kg	50.00		95	70-130		
2-Hexanone	86.4	10	µg/Kg	100.0		86	43-159		
Iodomethane	45.4	5.0	µg/Kg	50.00		91	70-130		
Isopropylbenzene	47.1	5.0	µg/Kg	50.00		94	69-125		
4-Isopropyltoluene	46.8	5.0	µg/Kg	50.00		94	62-128		
Methyl Acetate	89.9	5.0	µg/Kg	100.0		90	70-130		
Methylcyclohexane	47.6	5.0	µg/Kg	50.00		95	70-130		
Methylene Chloride	45.4	5.0	µg/Kg	50.00		91	65-129		

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted."

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 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0260 - SW846 5035A (Continued)**LCS (BBF0260-BS2)**

Prepared & Analyzed: 6/14/2023

4-Methyl-2-pentanone	96.4	10	µg/Kg	100.0		96	46-152		
Methyl-tert butyl ether	44.7	5.0	µg/Kg				70-131		
Naphthalene	48.0	5.0	µg/Kg	50.00		96	67-134		
N-propylbenzene	47.0	5.0	µg/Kg	50.00		94	63-127		
Styrene	47.0	5.0	µg/Kg	50.00		94	76-120		
1,1,2,2-Tetrachloroethane	46.5	5.0	µg/Kg	50.00		93	67-126		
1,1,1,2-Tetrachloroethane	47.8	5.0	µg/Kg	50.00		96	70-120		
Tetrachloroethene	45.2	5.0	µg/Kg	50.00		90	67-128		
Tetrahydrofuran	93.8	10	µg/Kg	100.0		94	33-175		
Toluene	46.3	5.0	µg/Kg	50.00		93	67-127		
1,2,4-Trichlorobenzene	45.8	5.0	µg/Kg	50.00		92	69-125		
1,2,3-Trichlorobenzene	45.4	5.0	µg/Kg	50.00		91	70-124		
1,1,2-Trichloroethane	46.4	5.0	µg/Kg	50.00		93	69-129		
1,1,1-Trichloroethane	46.5	5.0	µg/Kg	50.00		93	58-135		
Trichloroethene	46.7	5.0	µg/Kg	50.00		93	64-135		
Trichlorofluoromethane	48.6	5.0	µg/Kg	50.00		97	48-142		
1,2,3-Trichloropropane	45.8	5.0	µg/Kg	50.00		92	52-149		
1,1,2-Trichloro-1,2,2-trifluoroethane	45.3	5.0	µg/Kg	50.00		91	58-138		
1,3,5-Trimethylbenzene	46.8	5.0	µg/Kg	50.00		94	67-124		
1,2,4-Trimethylbenzene	47.3	5.0	µg/Kg	50.00		95	64-126		
Vinyl Acetate	45.4	10	µg/Kg	50.00		91	12-170		
Vinyl Chloride	47.8	5.0	µg/Kg	50.00		96	35-160		
o-xylene	47.1	5.0	µg/Kg	50.00		94	74-120		
m&p-xylenes	93.1	10	µg/Kg	100.0		93	69-117		
Xylenes, Total	140		µg/Kg				70-130		

Surrogate(s)

Surrogate: 4-Bromofluorobenzene	50.00	101	70-130
Surrogate: Dibromofluoromethane	50.00	97	70-130
Surrogate: 1,2-Dichloroethane-d4	50.00	101	70-130
Surrogate: Toluene-d8	50.00	101	70-130

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Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0260 - SW846 5035A (Continued)**Matrix Spike (BBF0260-MS1)****Source: AB57007-01**

Prepared & Analyzed: 6/14/2023

Acetone	90.2	23	µg/Kg dry	116.2	ND	78	10-235
Acetonitrile	448	58	µg/Kg dry	580.8	ND	77	70-130
Acrolein	82.4	58	µg/Kg dry	232.3	ND	35	10-220
Acrylonitrile	87.5	12	µg/Kg dry	116.2	ND	75	10-160
Benzene	45.0	5.8	µg/Kg dry	58.08	ND	77	29-149
Bromobenzene	36.6	5.8	µg/Kg dry	58.08	ND	63	10-141
Bromochloromethane	43.6	5.8	µg/Kg dry	58.08	ND	75	36-149
Bromodichloromethane	44.2	5.8	µg/Kg dry	58.08	ND	76	10-160
Bromoform	40.2	5.8	µg/Kg dry	58.08	ND	69	10-140
Bromomethane	50.4	5.8	µg/Kg dry	58.08	ND	87	11-167
2-Butanone	83.3	12	µg/Kg dry	116.2	ND	72	10-190
tert-Butyl Alcohol	161	23	µg/Kg dry	232.3	ND	69	10-195
Sec-butylbenzene	35.4	5.8	µg/Kg dry	58.08	ND	61	10-145
Tert-butylbenzene	37.8	5.8	µg/Kg dry	58.08	ND	65	10-151
N-butylbenzene	32.7	5.8	µg/Kg dry	58.08	ND	56	10-146
Carbon Disulfide	37.9	5.8	µg/Kg dry	58.08	ND	65	10-164
Carbon Tetrachloride	43.2	5.8	µg/Kg dry	58.08	ND	74	10-160
Chlorobenzene	39.5	5.8	µg/Kg dry	58.08	ND	68	13-143
Chloroethane	51.6	5.8	µg/Kg dry	58.08	ND	89	31-162
2-Chloroethyl Vinyl Ether	86.9	12	µg/Kg dry	116.2	ND	75	10-165
Chloroform	50.7	5.8	µg/Kg dry	58.08	ND	87	35-150
Chloromethane	49.4	5.8	µg/Kg dry	58.08	ND	85	27-152
4-Chlorotoluene	36.1	5.8	µg/Kg dry	58.08	ND	62	10-146
2-Chlorotoluene	37.2	5.8	µg/Kg dry	58.08	ND	64	10-142
Cyclohexane	43.5	5.8	µg/Kg dry	58.08	ND	75	70-130
1,2-Dibromo-3-chloropropane	35.6	12	µg/Kg dry	58.08	ND	61	10-155
Dibromochloromethane	42.6	5.8	µg/Kg dry	58.08	ND	73	10-153
1,2-Dibromoethane	41.6	5.8	µg/Kg dry	58.08	ND	72	72-129
Dibromomethane	42.8	5.8	µg/Kg dry	58.08	ND	74	36-147
Trans-1,4-dichloro-2-butene	71.8	5.8	µg/Kg dry	116.2	ND	62	10-151
1,4-Dichlorobenzene	33.2	5.8	µg/Kg dry	58.08	ND	57	10-138
1,3-Dichlorobenzene	33.1	5.8	µg/Kg dry	58.08	ND	57	10-139
1,2-Dichlorobenzene	33.2	5.8	µg/Kg dry	58.08	ND	57	10-142
Dichlorodifluoromethane	45.7	5.8	µg/Kg dry	58.08	ND	79	13-167
1,2-Dichloroethane	43.9	5.8	µg/Kg dry	58.08	ND	76	41-143
1,1-Dichloroethane	45.6	5.8	µg/Kg dry	58.08	ND	78	35-151
1,1-Dichloroethene	42.7	5.8	µg/Kg dry	58.08	ND	74	14-173
Trans-1,2-dichloroethene	41.5	5.8	µg/Kg dry	58.08	ND	71	17-161
Cis-1,2-dichloroethene	42.1	5.8	µg/Kg dry	58.08	ND	73	31-148
1,3-Dichloropropane	44.3	5.8	µg/Kg dry	58.08	ND	76	30-144
2,2-Dichloropropane	42.0	5.8	µg/Kg dry	58.08	ND	72	11-155
1,2-Dichloropropane	44.9	5.8	µg/Kg dry	58.08	ND	77	34-148
1,1-Dichloropropene	42.3	5.8	µg/Kg dry	58.08	ND	73	10-158
Cis-1,3-dichloropropene	42.3	5.8	µg/Kg dry	58.08	ND	73	10-167

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 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

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Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0260 - SW846 5035A (Continued)**Matrix Spike (BBF0260-MS1)****Source: AB57007-01**

Prepared & Analyzed: 6/14/2023

Trans-1,3-dichloropropene	40.3	5.8	µg/Kg dry	58.08	ND	69	10-153		
Ethyl Acetate	118 M1	12	µg/Kg dry	174.2	ND	68	70-130		
Ethylbenzene	40.1	5.8	µg/Kg dry	58.08	ND	69	10-159		
n-Heptane	32.1	5.8	µg/Kg dry		ND		70-130		
Hexachlorobutadiene	25.5	5.8	µg/Kg dry	58.08	ND	44	10-149		
Hexachloroethane	34.0	5.8	µg/Kg dry	58.08	ND	59	10-170		
n-Hexane	37.1 M1	5.8	µg/Kg dry	58.08	ND	64	70-130		
2-Hexanone	112	12	µg/Kg dry	116.2	ND	97	10-165		
Iodomethane	44.4	5.8	µg/Kg dry	58.08	ND	77	70-130		
Isopropylbenzene	39.3	5.8	µg/Kg dry	58.08	ND	68	10-154		
4-Isopropyltoluene	35.1	5.8	µg/Kg dry	58.08	ND	60	10-140		
Methyl Acetate	98.3	5.8	µg/Kg dry	116.2	ND	85	70-130		
Methylcyclohexane	37.3 M1	5.8	µg/Kg dry	58.08	ND	64	70-130		
Methylene Chloride	46.4	5.8	µg/Kg dry	58.08	ND	80	35-147		
4-Methyl-2-pentanone	94.8	12	µg/Kg dry	116.2	ND	82	14-151		
Methyl-tert butyl ether	43.8	5.8	µg/Kg dry		ND		52-142		
Naphthalene	29.1	5.8	µg/Kg dry	58.08	ND	50	10-154		
N-propylbenzene	37.8	5.8	µg/Kg dry	58.08	ND	65	10-153		
Styrene	38.1	5.8	µg/Kg dry	58.08	ND	66	10-144		
1,1,2,2-Tetrachloroethane	39.9	5.8	µg/Kg dry	58.08	ND	69	10-156		
1,1,1,2-Tetrachloroethane	43.1	5.8	µg/Kg dry	58.08	ND	74	10-159		
Tetrachloroethene	39.1	5.8	µg/Kg dry	58.08	ND	67	10-155		
Tetrahydrofuran	87.6	12	µg/Kg dry	116.2	ND	75	22-170		
Toluene	42.9	5.8	µg/Kg dry	58.08	ND	74	14-151		
1,2,4-Trichlorobenzene	26.4	5.8	µg/Kg dry	58.08	ND	45	10-136		
1,2,3-Trichlorobenzene	25.9	5.8	µg/Kg dry	58.08	ND	45	10-138		
1,1,2-Trichloroethane	44.1	5.8	µg/Kg dry	58.08	ND	76	10-162		
1,1,1-Trichloroethane	45.3	5.8	µg/Kg dry	58.08	ND	78	19-156		
Trichloroethene	43.2	5.8	µg/Kg dry	58.08	ND	74	10-185		
Trichlorofluoromethane	48.9	5.8	µg/Kg dry	58.08	ND	84	13-163		
1,2,3-Trichloropropane	41.2	5.8	µg/Kg dry	58.08	ND	71	10-149		
1,1,2-Trichloro-1,2,2-trifluoroethane	42.4	5.8	µg/Kg dry	58.08	ND	73	10-166		
1,3,5-Trimethylbenzene	37.3	5.8	µg/Kg dry	58.08	ND	64	10-148		
1,2,4-Trimethylbenzene	37.0	5.8	µg/Kg dry	58.08	ND	64	10-184		
Vinyl Acetate	16.6	12	µg/Kg dry	58.08	ND	29	10-104		
Vinyl Chloride	48.2	5.8	µg/Kg dry	58.08	ND	83	10-198		
o-xylene	40.4	5.8	µg/Kg dry	58.08	ND	70	10-155		
m&p-xylenes	78.9	12	µg/Kg dry	116.2	ND	68	10-158		
Xylenes, Total	119		µg/Kg dry		0.00		70-130		

Surrogate(s)

Surrogate: 4-Bromofluorobenzene	50.00	100	70-130
Surrogate: Dibromofluoromethane	50.00	99	70-130

**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0260 - SW846 5035A (Continued)**Matrix Spike (BBF0260-MS1)****Source: AB57007-01**

Prepared & Analyzed: 6/14/2023

Surrogate(s)

Surrogate: 1,2-Dichloroethane-d4

50.00

103

70-130

Surrogate: Toluene-d8

50.00

100

70-130

Matrix Spike Dup (BBF0260-MSD1)**Source: AB57007-01**

Prepared & Analyzed: 6/14/2023

Acetone	91.4	23	µg/Kg dry	116.2	ND	79	10-235	1	30
Acetonitrile	449	58	µg/Kg dry	580.8	ND	77	70-130	0.2	25
Acrolein	85.0	58	µg/Kg dry	232.3	ND	37	10-220	3	22
Acrylonitrile	89.9	12	µg/Kg dry	116.2	ND	77	10-160	3	30
Benzene	44.2	5.8	µg/Kg dry	58.08	ND	76	29-149	2	12
Bromobenzene	35.0	5.8	µg/Kg dry	58.08	ND	60	10-141	4	19
Bromochloromethane	43.8	5.8	µg/Kg dry	58.08	ND	75	36-149	0.4	11
Bromodichloromethane	44.1	5.8	µg/Kg dry	58.08	ND	76	10-160	0.2	17
Bromoform	40.1	5.8	µg/Kg dry	58.08	ND	69	10-140	0.3	19
Bromomethane	47.5	5.8	µg/Kg dry	58.08	ND	82	11-167	6	51
2-Butanone	86.4	12	µg/Kg dry	116.2	ND	74	10-190	4	25
tert-Butyl Alcohol	178	23	µg/Kg dry	232.3	ND	77	10-195	10	23
Sec-butylbenzene	31.3	5.8	µg/Kg dry	58.08	ND	54	10-145	12	20
Tert-butylbenzene	34.1	5.8	µg/Kg dry	58.08	ND	59	10-151	10	19
N-butylbenzene	27.6	5.8	µg/Kg dry	58.08	ND	47	10-146	17	23
Carbon Disulfide	35.1	5.8	µg/Kg dry	58.08	ND	60	10-164	8	27
Carbon Tetrachloride	42.0	5.8	µg/Kg dry	58.08	ND	72	10-160	3	25
Chlorobenzene	38.5	5.8	µg/Kg dry	58.08	ND	66	13-143	3	18
Chloroethane	49.4	5.8	µg/Kg dry	58.08	ND	85	31-162	4	13
2-Chloroethyl Vinyl Ether	90.0	12	µg/Kg dry	116.2	ND	77	10-165	3	15
Chloroform	50.5	5.8	µg/Kg dry	58.08	ND	87	35-150	0.4	11
Chloromethane	47.2	5.8	µg/Kg dry	58.08	ND	81	27-152	5	11
4-Chlorotoluene	33.6	5.8	µg/Kg dry	58.08	ND	58	10-146	7	21
2-Chlorotoluene	34.9	5.8	µg/Kg dry	58.08	ND	60	10-142	7	21
Cyclohexane	41.8	5.8	µg/Kg dry	58.08	ND	72	70-130	4	25
1,2-Dibromo-3-chloropropane	37.0	12	µg/Kg dry	58.08	ND	64	10-155	4	22
Dibromochloromethane	42.5	5.8	µg/Kg dry	58.08	ND	73	10-153	0.2	18
1,2-Dibromoethane	41.7	5.8	µg/Kg dry	58.08	ND	72	72-129	0.3	25
Dibromomethane	42.4	5.8	µg/Kg dry	58.08	ND	73	36-147	0.9	10
Trans-1,4-dichloro-2-butene	74.6	5.8	µg/Kg dry	116.2	ND	64	10-151	4	21
1,4-Dichlorobenzene	30.7	5.8	µg/Kg dry	58.08	ND	53	10-138	8	21
1,3-Dichlorobenzene	30.5	5.8	µg/Kg dry	58.08	ND	53	10-139	8	21
1,2-Dichlorobenzene	31.5	5.8	µg/Kg dry	58.08	ND	54	10-142	5	20
Dichlorodifluoromethane	45.3	5.8	µg/Kg dry	58.08	ND	78	13-167	0.8	15
1,2-Dichloroethane	44.1	5.8	µg/Kg dry	58.08	ND	76	41-143	0.6	8
1,1-Dichloroethane	45.1	5.8	µg/Kg dry	58.08	ND	78	35-151	1	11
1,1-Dichloroethene	41.9	5.8	µg/Kg dry	58.08	ND	72	14-173	2	14

**EMSL Analytical, Inc.**

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EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320
EMSL Sales Rep: Jeromy Bish
Received: 06/01/2023 09:00
Reported: 06/22/2023 18:35

Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0260 - SW846 5035A (Continued)**Matrix Spike Dup (BBF0260-MSD1)****Source: AB57007-01**

Prepared & Analyzed: 6/14/2023

Trans-1,2-dichloroethene	40.9	5.8	µg/Kg dry	58.08	ND	70	17-161	1	10
Cis-1,2-dichloroethene	41.3	5.8	µg/Kg dry	58.08	ND	71	31-148	2	25
1,3-Dichloropropane	43.9	5.8	µg/Kg dry	58.08	ND	76	30-144	0.8	10
2,2-Dichloropropane	43.2	5.8	µg/Kg dry	58.08	ND	74	11-155	3	20
1,2-Dichloropropane	44.6	5.8	µg/Kg dry	58.08	ND	77	34-148	0.6	11
1,1-Dichloropropene	41.4	5.8	µg/Kg dry	58.08	ND	71	10-158	2	20
Cis-1,3-dichloropropene	43.4	5.8	µg/Kg dry	58.08	ND	75	10-167	3	17
Trans-1,3-dichloropropene	41.6	5.8	µg/Kg dry	58.08	ND	72	10-153	3	17
Ethyl Acetate	116 M1	12	µg/Kg dry	174.2	ND	66	70-130	2	25
Ethylbenzene	38.6	5.8	µg/Kg dry	58.08	ND	66	10-159	4	22
n-Heptane	26.1	5.8	µg/Kg dry		ND		70-130	21	25
Hexachlorobutadiene	19.5 M1	5.8	µg/Kg dry	58.08	ND	34	10-149	27	26
Hexachloroethane	31.5	5.8	µg/Kg dry	58.08	ND	54	10-170	8	27
n-Hexane	32.3 M1	5.8	µg/Kg dry	58.08	ND	56	70-130	14	25
2-Hexanone	110	12	µg/Kg dry	116.2	ND	95	10-165	2	18
Iodomethane	44.0	5.8	µg/Kg dry	58.08	ND	76	70-130	1	25
Isopropylbenzene	36.6	5.8	µg/Kg dry	58.08	ND	63	10-154	7	23
4-Isopropyltoluene	31.1	5.8	µg/Kg dry	58.08	ND	54	10-140	12	22
Methyl Acetate	103	5.8	µg/Kg dry	116.2	ND	88	70-130	4	25
Methylcyclohexane	33.1 M1	5.8	µg/Kg dry	58.08	ND	57	70-130	12	25
Methylene Chloride	44.9	5.8	µg/Kg dry	58.08	ND	77	35-147	3	12
4-Methyl-2-pentanone	97.4	12	µg/Kg dry	116.2	ND	84	14-151	3	15
Methyl-tert butyl ether	45.8	5.8	µg/Kg dry		ND		52-142	4	7
Naphthalene	28.2	5.8	µg/Kg dry	58.08	ND	48	10-154	3	25
N-propylbenzene	34.2	5.8	µg/Kg dry	58.08	ND	59	10-153	10	23
Styrene	36.8	5.8	µg/Kg dry	58.08	ND	63	10-144	3	25
1,1,2,2-Tetrachloroethane	39.8	5.8	µg/Kg dry	58.08	ND	69	10-156	0.2	17
1,1,1,2-Tetrachloroethane	43.2	5.8	µg/Kg dry	58.08	ND	74	10-159	0.3	22
Tetrachloroethene	36.8	5.8	µg/Kg dry	58.08	ND	63	10-155	6	20
Tetrahydrofuran	89.2	12	µg/Kg dry	116.2	ND	77	22-170	2	15
Toluene	42.0	5.8	µg/Kg dry	58.08	ND	72	14-151	2	15
1,2,4-Trichlorobenzene	22.8	5.8	µg/Kg dry	58.08	ND	39	10-136	15	24
1,2,3-Trichlorobenzene	22.8	5.8	µg/Kg dry	58.08	ND	39	10-138	13	24
1,1,2-Trichloroethane	44.4	5.8	µg/Kg dry	58.08	ND	76	10-162	0.7	9
1,1,1-Trichloroethane	45.0	5.8	µg/Kg dry	58.08	ND	77	19-156	0.7	19
Trichloroethene	41.9	5.8	µg/Kg dry	58.08	ND	72	10-185	3	18
Trichlorofluoromethane	46.4	5.8	µg/Kg dry	58.08	ND	80	13-163	5	18
1,2,3-Trichloropropane	41.2	5.8	µg/Kg dry	58.08	ND	71	10-149	0.08	18
1,1,2-Trichloro-1,2,2-trifluoroethane	41.6	5.8	µg/Kg dry	58.08	ND	72	10-166	2	25
1,3,5-Trimethylbenzene	34.6	5.8	µg/Kg dry	58.08	ND	60	10-148	7	23
1,2,4-Trimethylbenzene	34.3	5.8	µg/Kg dry	58.08	ND	59	10-184	8	23
Vinyl Acetate	15.2	12	µg/Kg dry	58.08	ND	26	10-104	9	22
Vinyl Chloride	46.8	5.8	µg/Kg dry	58.08	ND	81	10-198	3	16
o-xylene	39.0	5.8	µg/Kg dry	58.08	ND	67	10-155	4	20

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**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0260 - SW846 5035A (Continued)**Matrix Spike Dup (BBF0260-MSD1)****Source: AB57007-01**

Prepared & Analyzed: 6/14/2023

m&p-xylenes	74.9	12	µg/Kg dry	116.2	ND	64	10-158	5	21
Xylenes, Total	114		µg/Kg dry		0.00		70-130	5	25

Surrogate(s)

Surrogate: 4-Bromofluorobenzene	50.00	99	70-130
Surrogate: Dibromofluoromethane	50.00	98	70-130
Surrogate: 1,2-Dichloroethane-d4	50.00	101	70-130
Surrogate: Toluene-d8	50.00	99	70-130

Batch: BBF0274 - SW846 5035A**Blank (BBF0274-BLK1)**

Prepared & Analyzed: 6/15/2023

Acetone	ND	20	µg/Kg
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Surrogate(s)

Surrogate: 4-Bromofluorobenzene	50.00	97	70-130
Surrogate: Dibromofluoromethane	50.00	102	70-130
Surrogate: 1,2-Dichloroethane-d4	50.00	108	70-130
Surrogate: Toluene-d8	50.00	105	70-130

LCS (BBF0274-BS1)

Prepared & Analyzed: 6/15/2023

Acetone	81.0	20	µg/Kg	100.0	81	29-158
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Surrogate(s)

Surrogate: 4-Bromofluorobenzene	50.00	99	70-130
Surrogate: Dibromofluoromethane	50.00	98	70-130
Surrogate: 1,2-Dichloroethane-d4	50.00	100	70-130
Surrogate: Toluene-d8	50.00	100	70-130

LCS (BBF0274-BS2)

Prepared & Analyzed: 6/15/2023

Acetone	78.5	20	µg/Kg	100.0	79	29-158
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Surrogate(s)

Surrogate: 4-Bromofluorobenzene	50.00	98	70-130
Surrogate: Dibromofluoromethane	50.00	99	70-130
Surrogate: 1,2-Dichloroethane-d4	50.00	102	70-130
Surrogate: Toluene-d8	50.00	101	70-130

**EMSL Analytical, Inc.**

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 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Quality Control (Continued)

GCMS-VOA (Continued)

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0274 - SW846 5035A (Continued)**Matrix Spike (BBF0274-MS1)****Source: AB56400-03RE2**

Prepared & Analyzed: 6/15/2023

Acetone	281	20	µg/Kg dry	100.3	246	36	10-235		
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Surrogate(s)

Surrogate: 4-Bromofluorobenzene	50.00	92	70-130
Surrogate: Dibromofluoromethane	50.00	100	70-130
Surrogate: 1,2-Dichloroethane-d4	50.00	105	70-130
Surrogate: Toluene-d8	50.00	97	70-130

Matrix Spike Dup (BBF0274-MSD1)**Source: AB56400-03RE2**

Prepared & Analyzed: 6/15/2023

Acetone	311	20	µg/Kg dry	100.3	246	65	10-235	10	30
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Surrogate(s)

Surrogate: 4-Bromofluorobenzene	50.00	92	70-130
Surrogate: Dibromofluoromethane	50.00	100	70-130
Surrogate: 1,2-Dichloroethane-d4	50.00	108	70-130
Surrogate: Toluene-d8	50.00	96	70-130

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EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

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 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

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Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Quality Control (Continued)

Wet

Analyte	Result Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch: BBF0287 - Wet**Blank (BBF0287-BLK1)**

Prepared & Analyzed: 6/15/2023

% Solids	ND	0.00	%
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Duplicate (BBF0287-DUP1)**Source: AB56400-01**

Prepared & Analyzed: 6/15/2023

% Solids	100	0.00	%	100	0.260	10
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**EMSL Analytical, Inc.**

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 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

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Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Certified Analyses included in this Report

Analyte	CAS #	Certifications
<i>SW 846-8260D in Soils</i>		
Acetone	67-64-1	NJDEP
Acetonitrile	75-05-8	NJDEP
Acrolein	107-02-8	NJDEP
Acrylonitrile	107-13-1	NJDEP
Benzene	71-43-2	NJDEP
Bromobenzene	108-86-1	NJDEP
Bromochloromethane	74-97-5	NJDEP
Bromodichloromethane	75-27-4	NJDEP
Bromoform	75-25-2	NJDEP
Bromomethane	74-83-9	NJDEP
2-Butanone	78-93-3	NJDEP
tert-Butyl Alcohol	75-65-0	NJDEP
Sec-butylbenzene	135-98-8	NJDEP
Tert-butylbenzene	98-06-6	NJDEP
N-butylbenzene	104-51-8	NJDEP
Carbon Disulfide	75-15-0	NJDEP
Carbon Tetrachloride	56-23-5	NJDEP
Chlorobenzene	108-90-7	NJDEP
Chloroethane	75-00-3	NJDEP
2-Chloroethyl Vinyl Ether	110-75-8	NJDEP
Chloroform	67-66-3	NJDEP
Chloromethane	74-87-3	NJDEP
4-Chlorotoluene	106-43-4	NJDEP
2-Chlorotoluene	95-49-8	NJDEP
Cyclohexane	110-82-7	NJDEP
1,2-Dibromo-3-chloropropane	96-12-8	NJDEP
Dibromochloromethane	124-48-1	NJDEP
1,2-Dibromoethane	106-93-4	NJDEP
Dibromomethane	74-95-3	NJDEP
Trans-1,4-dichloro-2-butene	110-57-6	NJDEP
1,4-Dichlorobenzene	106-46-7	NJDEP
1,3-Dichlorobenzene	541-73-1	NJDEP
1,2-Dichlorobenzene	95-50-1	NJDEP
Dichlorodifluoromethane	75-71-8	NJDEP
1,2-Dichloroethane	107-06-2	NJDEP
1,1-Dichloroethane	75-34-3	NJDEP
1,1-Dichloroethene	75-35-4	NJDEP
Trans-1,2-dichloroethene	156-60-5	NJDEP
Cis-1,2-dichloroethene	156-59-2	NJDEP
1,3-Dichloropropane	142-28-9	NJDEP

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Received: 06/01/2023 09:00

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**Certified Analyses included in this Report
 (Continued)**

Analyte	CAS #	Certifications
<i>SW 846-8260D in Soils (Continued)</i>		
2,2-Dichloropropane	594-20-7	NJDEP
1,2-Dichloropropane	78-87-5	NJDEP
1,1-Dichloropropene	563-58-6	NJDEP
Cis-1,3-dichloropropene	10061-01-5	NJDEP
Trans-1,3-dichloropropene	10061-02-6	NJDEP
Ethylbenzene	100-41-4	NJDEP
Hexachlorobutadiene	87-68-3	NJDEP
Hexachloroethane	67-72-1	NJDEP
2-Hexanone	591-78-6	NJDEP
Iodomethane	74-88-4	NJDEP
Isopropylbenzene	98-82-8	NJDEP
4-Isopropyltoluene	99-87-6	NJDEP
Methyl Acetate	79-20-9	NJDEP
Methylcyclohexane	108-87-2	NJDEP
Methylene Chloride	75-09-2	NJDEP
4-Methyl-2-pentanone	108-10-1	NJDEP
Methyl-tert butyl ether	1634-04-4	NJDEP
Naphthalene	91-20-3	NJDEP
N-propylbenzene	103-65-1	NJDEP
Styrene	100-42-5	NJDEP
1,1,2,2-Tetrachloroethane	79-34-5	NJDEP
1,1,1,2-Tetrachloroethane	630-20-6	NJDEP
Tetrachloroethene	127-18-4	NJDEP
Toluene	108-88-3	NJDEP
1,2,4-Trichlorobenzene	120-82-1	NJDEP
1,2,3-Trichlorobenzene	87-61-6	NJDEP
1,1,2-Trichloroethane	79-00-5	NJDEP
1,1,1-Trichloroethane	71-55-6	NJDEP
Trichloroethene	79-01-6	NJDEP
Trichlorofluoromethane	75-69-4	NJDEP
1,2,3-Trichloropropane	96-18-4	NJDEP
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	NJDEP
1,3,5-Trimethylbenzene	108-67-8	NJDEP
1,2,4-Trimethylbenzene	95-63-6	NJDEP
Vinyl Acetate	108-05-4	NJDEP
Vinyl Chloride	75-01-4	NJDEP
o-xylene	95-47-6	NJDEP
m&p-xylenes	179601-23-1	NJDEP
Xylenes, Total	1330-20-7	NJDEP

**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
 Fuss & O'Neill, Inc. [ENVI54]
 146 Hartford Road
 Manchester, CT 06040
 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

List of Certifications

Code	Description	Number	Expires
MADEP	Massachusetts Department of Environmental Protection	M-NJ337	06/30/2023
California ELAP	California Water Boards	1877	06/30/2024
A2LA	A2LA Environmental Certificate	2845.01	07/31/2024
AIHA LAP	EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC-ELLAP Accredited	100194	01/01/2025
NJDEP	New Jersey Department of Environmental Protection	03036	06/30/2023
PADEP	Pennsylvania Department of Environmental Protection	68-00367	11/30/2023
NYSDOH	New York State Department of Health	10872	04/01/2024
CTDPH	Connecticut Department of Public Health	PH-0270	06/23/2023

Please see the specific Field of Testing (FOT) on www.emsl.com <<http://www.emsl.com>> for a complete listing of parameters for which EMSL is certified.

**EMSL Analytical, Inc.**

200 Route 130, Cinnaminson, NJ, 08077
 Telephone: 856-858-4800 Fax: 856-786-5974
 EMSL-CIN-01

EMSL Order ID: 012356400**LIMS Reference ID:** AB56400**EMSL Customer ID:** ENVI54

Attention: Wendy Tram
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 146 Hartford Road
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 (860) 646-2469
 wtram@fando.com

Project Name: Needham Crumb Rubber Needham, MA

Customer PO: 20081266.1320

EMSL Sales Rep: Jeromy Bish

Received: 06/01/2023 09:00

Reported: 06/22/2023 18:35

Notes and Definitions

Item	Definition
CS	Internal Standard were outside the method control limits due to the sample matrix. Results were confirmed by re-analysis.
HT	This analysis was performed outside the EPA recommended holding time.
HT1	This sample was received with the EPA recommended holding time expired.
M1	The spike recovery for this QC sample is outside of established control limits possibly due to sample matrix interference. Laborato
S6	Surrogate recovery is outside control limits due to matrix interference.
[2C]	Reported from the second channel in dual column analysis.
DF	Dilution Factor
MDL	Method Detection Limit.
ND	Analyte was NOT DETECTED at or above the detection limit.
Q	Qualifier
RL	Reporting Limit
%REC	Percent Recovery
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated

Measurement of uncertainty and any applicable definitions of method modifications are available upon request. Per EPA NLLAP policy, sample results are not blank corrected.



301 Fulling Mill Road | Middletown, PA 17057 | Phone: 717-944-5541 | Fax: 717-944-1430 | www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618

State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

Analytical Results Report For

EMSL Inc.

Project AB56400

Workorder 3307496

Report ID 252896 on 6/22/2023

Certificate of Analysis

Enclosed are the analytical results for samples received by the laboratory on Jun 10, 2023.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Sarah Leung (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Global.
ALS Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Recipient(s):

Reports - EMSL Inc.

Travis Albert - EMSL Analytical Inc.

Sarah Leung

Sarah Leung

(ALS Digital Signature)

Project Coordinator

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Project AB56400
Workorder 3307496



Sample Summary

<u>Lab ID</u>	<u>Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Collector</u>	<u>Collection Company</u>
3307496001	AB56400-01	Solid	05/31/2023 10:15	06/10/2023 08:38	CBC	Collected By Client
3307496002	AB56400-02	Solid	05/31/2023 10:50	06/10/2023 08:38	CBC	Collected By Client
3307496003	AB56400-03	Solid	05/31/2023 11:30	06/10/2023 08:38	CBC	Collected By Client



Project AB56400
Workorder 3307496

Reference

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136.
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Practical Quantitation Limit for this Project
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.

Project AB56400
Workorder 3307496



Project Notations

Sample Notations

Lab ID **Sample ID**

Result Notations

Notation Ref.

- | | |
|---|---|
| 1 | The surrogate Phenol-d5 for method SW846 8270D was outside of control limits. The % Recovery was reported as 33.5 and the control limits were 35 to 111. This result was reported at a dilution of 1. |
| 2 | Analyte was analyzed past the 7 day holding time. |
| 3 | The surrogate Phenol-d5 for method SW846 8270D was outside of control limits. The % Recovery was reported as 32.7 and the control limits were 35 to 111. This result was reported at a dilution of 1. |
| 4 | The QC type LLICV for method SW846 6020 was outside the control limits for the analyte Se. The % RSD was reported as 30.4 and the control limits were 0 to 20. |
| 5 | The surrogate 2-Fluorophenol for method SW846 8270D was outside of control limits. The % Recovery was reported as 21.1 and the control limits were 26 to 116. This result was reported at a dilution of 10. |
| 6 | The surrogate 2-Fluorophenol for method SW846 8270D was outside of control limits. The % Recovery was reported as 23.9 and the control limits were 26 to 116. This result was reported at a dilution of 1. |
| 7 | The surrogate Phenol-d5 for method SW846 8270D was outside of control limits. The % Recovery was reported as 29.9 and the control limits were 35 to 111. This result was reported at a dilution of 1. |
| 8 | The surrogate Phenol-d5 for method SW846 8270D was outside of control limits. The % Recovery was reported as 29.1 and the control limits were 35 to 111. This result was reported at a dilution of 10. |

Project AB56400
Workorder 3307496



Detected Results Summary

Client Sample ID	AB56400-01	Collected	05/31/2023 10:15
Lab Sample ID	3307496001	Lab Receipt	06/10/2023 08:38

Compound	Result	Units	RDL	Method	Flag
METALS					
Chromium, Total	2.2	mg/kg	0.99	SW846 6020B	#
Iron, Total	816	mg/kg	24.6	SW846 6020B	#
Lead, Total	11.7	mg/kg	0.99	SW846 6020B	#
Manganese, Total	6.2	mg/kg	2.5	SW846 6020B	#
Zinc, Total	12800	mg/kg	246	SW846 6020B	#
SEMIVOLATILES					
Acenaphthylene	71.4	ug/kg	44.0	SW846 8270D	#
Acetophenone	125	ug/kg	88.0	SW846 8270D	#
Anthracene	85.1	ug/kg	44.0	SW846 8270D	#
bis(2-Ethylhexyl)phthalate	4430	ug/kg	88.0	SW846 8270D	#
Chrysene	1810	ug/kg	44.0	SW846 8270D	#
Fluoranthene	3190	ug/kg	44.0	SW846 8270D	#
Naphthalene	88.3	ug/kg	44.0	SW846 8270D	#
N-Nitrosodiphenylamine	134	ug/kg	88.0	SW846 8270D	#
Phenanthrene	582	ug/kg	44.0	SW846 8270D	#
Pyrene	6000	ug/kg	220	SW846 8270D	#
WET CHEMISTRY					
Moisture	0.3	%	0.1	S2540G-11	#
Total Solids	99.7	%	0.1	S2540G-11	#

Project AB56400
Workorder 3307496



Detected Results Summary

Client Sample ID	AB56400-02	Collected	05/31/2023 10:50
Lab Sample ID	3307496002	Lab Receipt	06/10/2023 08:38

Compound	Result	Units	RDL	Method	Flag
METALS					
Chromium, Total	2.8	mg/kg	1.0	SW846 6020B	#
Iron, Total	748	mg/kg	24.9	SW846 6020B	#
Lead, Total	9.0	mg/kg	1.0	SW846 6020B	#
Manganese, Total	6.2	mg/kg	2.5	SW846 6020B	#
Zinc, Total	13200	mg/kg	249	SW846 6020B	#
SEMIVOLATILES					
Acenaphthylene	73.5	ug/kg	42.5	SW846 8270D	#
Acetophenone	170	ug/kg	85.0	SW846 8270D	#
Anthracene	88.2	ug/kg	42.5	SW846 8270D	#
Benzo(g,h,i)perylene	1480	ug/kg	42.5	SW846 8270D	#
bis(2-Ethylhexyl)phthalate	6510	ug/kg	425	SW846 8270D	#
Fluoranthene	3790	ug/kg	42.5	SW846 8270D	#
Naphthalene	92.0	ug/kg	42.5	SW846 8270D	#
N-Nitrosodiphenylamine	128	ug/kg	85.0	SW846 8270D	#
Phenanthrene	569	ug/kg	42.5	SW846 8270D	#
Pyrene	6780	ug/kg	213	SW846 8270D	#
WET CHEMISTRY					
Moisture	0.3	%	0.1	S2540G-11	#
Total Solids	99.7	%	0.1	S2540G-11	#

Project AB56400
Workorder 3307496



Detected Results Summary

Client Sample ID	AB56400-03	Collected	05/31/2023 11:30
Lab Sample ID	3307496003	Lab Receipt	06/10/2023 08:38

Compound	Result	Units	RDL	Method	Flag
METALS					
Chromium, Total	2.4	mg/kg	1.0	SW846 6020B	#
Iron, Total	554	mg/kg	25.0	SW846 6020B	#
Lead, Total	9.0	mg/kg	1.0	SW846 6020B	#
Manganese, Total	5.0	mg/kg	2.5	SW846 6020B	#
Zinc, Total	10900	mg/kg	250	SW846 6020B	#
SEMIVOLATILES					
Acenaphthylene	76.3	ug/kg	42.5	SW846 8270D	#
Acetophenone	146	ug/kg	85.0	SW846 8270D	#
Anthracene	113	ug/kg	42.5	SW846 8270D	#
Benzo(g,h,i)perylene	1290	ug/kg	42.5	SW846 8270D	#
bis(2-Ethylhexyl)phthalate	5070	ug/kg	85.0	SW846 8270D	#
Chrysene	1780	ug/kg	42.5	SW846 8270D	#
Fluoranthene	4650	ug/kg	42.5	SW846 8270D	#
Naphthalene	88.9	ug/kg	42.5	SW846 8270D	#
Phenanthrene	717	ug/kg	42.5	SW846 8270D	#
Pyrene	7110	ug/kg	425	SW846 8270D	#
WET CHEMISTRY					
Moisture	0.3	%	0.1	S2540G-11	#
Total Solids	99.7	%	0.1	S2540G-11	#

Project AB56400
Workorder 3307496



Results

Client Sample ID	AB56400-01	Collected	05/31/2023 10:15
Lab Sample ID	3307496001	Lab Receipt	06/10/2023 08:38

METALS

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND	mg/kg	1.5	SW846 6020B	5	06/21/2023 14:56	MO	C
Cadmium, Total	ND	ND	mg/kg	0.49	SW846 6020B	5	06/21/2023 14:56	MO	C
Chromium, Total	2.2		mg/kg	0.99	SW846 6020B	5	06/21/2023 14:56	MO	C
Iron, Total	816		mg/kg	24.6	SW846 6020B	5	06/21/2023 14:56	MO	C
Lead, Total	11.7		mg/kg	0.99	SW846 6020B	5	06/21/2023 14:56	MO	C
Manganese, Total	6.2		mg/kg	2.5	SW846 6020B	5	06/21/2023 14:56	MO	C
Mercury, Total	ND	ND	mg/kg	0.047	SW846 7471B	1	06/14/2023 11:35	JSE	A
Selenium, Total	ND	ND	mg/kg	2.5	SW846 6020B	5	06/21/2023 14:56	MO	C
Zinc, Total	12800		mg/kg	246	SW846 6020B	500	06/21/2023 15:14	MO	C

SEMIVOLATILES

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
1,2,4,5-Tetrachlorobenzene	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
1,4-Dioxane	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
2,3,4,6-Tetrachlorophenol	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
2,4,5-Trichlorophenol	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
2,4,6-Trichlorophenol	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
2,4-Dichlorophenol	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
2,4-Dimethylphenol	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
2,4-Dinitrophenol	ND	ND	ug/kg	352	SW846 8270D	1	06/14/2023 18:27	S7M	A
2,4-Dinitrotoluene	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
2,6-Dinitrotoluene	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
2-Chloronaphthalene	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
2-Chlorophenol	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
2-Methyl-4,6-dinitrophenol	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
2-Methylnaphthalene	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
2-Nitroaniline	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
2-Nitrophenol	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
3,3-Dichlorobenzidine	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
3-Nitroaniline	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
4-Bromophenyl-phenylether	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
4-Chloro-3-methylphenol	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
4-Chloroaniline	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
4-Chlorophenyl-phenylether	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
4-Nitroaniline	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
4-Nitrophenol	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
Acenaphthene	ND	ND	ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Acenaphthylene	71.4		ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Acetophenone	125		ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Anthracene	85.1		ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Atrazine	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Benzaldehyde	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
Benzo(a)anthracene	ND	ND	ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Benzo(a)pyrene	ND	ND	ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Benzo(b)fluoranthene	ND	ND	ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Benzo(g,h,i)perylene	ND	ND	ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A

Project AB56400
Workorder 3307496



Results

Client Sample ID	AB56400-01	Collected	05/31/2023 10:15
Lab Sample ID	3307496001	Lab Receipt	06/10/2023 08:38

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Benzo(k)fluoranthene	ND	ND	ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Biphenyl	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
bis(2-Chloroethoxy)methane	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
bis(2-Chloroethyl)ether	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
bis(2-Chloroisopropyl)ether	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
bis(2-Ethylhexyl)phthalate	4430		ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Butylbenzylphthalate	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Caprolactam	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
Carbazole	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Chrysene	1810		ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Dibenzo(a,h)anthracene	ND	ND	ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Dibenzofuran	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Diethylphthalate	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Dimethylphthalate	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Di-n-Butylphthalate	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Di-n-Octylphthalate	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Fluoranthene	3190		ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Fluorene	ND	ND	ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Hexachlorobenzene	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Hexachlorobutadiene	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Hexachlorocyclopentadiene	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
Hexachloroethane	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Indeno(1,2,3-cd)pyrene	ND	ND	ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Isophorone	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
mp-Cresol	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
Naphthalene	88.3		ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Nitrobenzene	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
N-Nitroso-di-n-propylamine	ND	ND	ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
N-Nitrosodiphenylamine	134		ug/kg	88.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
o-Cresol	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
Pentachlorophenol	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
Phenanthrene	582		ug/kg	44.0	SW846 8270D	1	06/14/2023 18:27	S7M	A
Phenol	ND	ND	ug/kg	176	SW846 8270D	1	06/14/2023 18:27	S7M	A
Pyrene	6000		ug/kg	220	SW846 8270D	5	06/17/2023 05:31	M1O	A

Project AB56400
Workorder 3307496



Results

Client Sample ID	AB56400-01	Collected	05/31/2023 10:15
Lab Sample ID	3307496001	Lab Receipt	06/10/2023 08:38

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
<i>SURROGATES</i>									
Compound	CAS No			Recovery	Limits(%)		Analysis Date/Time		Qualifiers
2,4,6-Tribromophenol	118-79-6			54.2%	19 – 132		06/14/2023 18:27		
2,4,6-Tribromophenol	118-79-6			52.2%	19 – 132		06/17/2023 05:31		
2-Fluorobiphenyl	321-60-8			56.1%	40 – 110		06/14/2023 18:27		
2-Fluorobiphenyl	321-60-8			57.2%	40 – 110		06/17/2023 05:31		
2-Fluorophenol	367-12-4			26.4%	26 – 116		06/14/2023 18:27		
2-Fluorophenol	367-12-4			28.7%	26 – 116		06/17/2023 05:31		
Nitrobenzene-d5	4165-60-0			52.8%	38 – 112		06/14/2023 18:27		
Nitrobenzene-d5	4165-60-0			48.1%	38 – 112		06/17/2023 05:31		
Phenol-d5	4165-62-2			33.5*	35 – 111		06/14/2023 18:27		1
Phenol-d5	4165-62-2			37.4%	35 – 111		06/17/2023 05:31		
Terphenyl-d14	98904-43-9			67.9%	45 – 126		06/14/2023 18:27		
Terphenyl-d14	98904-43-9			58.6%	45 – 126		06/17/2023 05:31		

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Moisture	0.3		%	0.1	S2540G-11	1	06/12/2023 12:43	SXS	A
Total Solids	99.7	2	%	0.1	S2540G-11	1	06/12/2023 12:43	SXS	A

Project AB56400
Workorder 3307496



Results

Client Sample ID	AB56400-02	Collected	05/31/2023 10:50
Lab Sample ID	3307496002	Lab Receipt	06/10/2023 08:38

METALS

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND	mg/kg	1.5	SW846 6020B	5	06/22/2023 16:34	MO	D
Cadmium, Total	ND	ND	mg/kg	0.50	SW846 6020B	5	06/22/2023 16:34	MO	D
Chromium, Total	2.8		mg/kg	1.0	SW846 6020B	5	06/22/2023 16:34	MO	D
Iron, Total	748		mg/kg	24.9	SW846 6020B	5	06/22/2023 16:34	MO	D
Lead, Total	9.0		mg/kg	1.0	SW846 6020B	5	06/22/2023 16:34	MO	D
Manganese, Total	6.2		mg/kg	2.5	SW846 6020B	5	06/22/2023 16:34	MO	D
Mercury, Total	ND	ND	mg/kg	0.048	SW846 7471B	1	06/14/2023 11:38	JSE	A
Selenium, Total	ND	ND,4	mg/kg	2.5	SW846 6020B	5	06/22/2023 16:34	MO	D
Zinc, Total	13200		mg/kg	249	SW846 6020B	500	06/22/2023 16:44	MO	D

SEMIVOLATILES

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
1,2,4,5-Tetrachlorobenzene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
1,4-Dioxane	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
2,3,4,6-Tetrachlorophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
2,4,5-Trichlorophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
2,4,6-Trichlorophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
2,4-Dichlorophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
2,4-Dimethylphenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
2,4-Dinitrophenol	ND	ND	ug/kg	340	SW846 8270D	1	06/14/2023 18:52	S7M	A
2,4-Dinitrotoluene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
2,6-Dinitrotoluene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
2-Chloronaphthalene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
2-Chlorophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
2-Methyl-4,6-dinitrophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
2-Methylnaphthalene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
2-Nitroaniline	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
2-Nitrophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
3,3-Dichlorobenzidine	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
3-Nitroaniline	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
4-Bromophenyl-phenylether	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
4-Chloro-3-methylphenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
4-Chloroaniline	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
4-Chlorophenyl-phenylether	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
4-Nitroaniline	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
4-Nitrophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
Acenaphthene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A
Acenaphthylene	73.5		ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A
Acetophenone	170		ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
Anthracene	88.2		ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A
Atrazine	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
Benzaldehyde	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
Benzo(a)anthracene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A
Benzo(a)pyrene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A
Benzo(b)fluoranthene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A
Benzo(g,h,i)perylene	1480		ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A

Project AB56400
Workorder 3307496



Results

Client Sample ID	AB56400-02	Collected	05/31/2023 10:50
Lab Sample ID	3307496002	Lab Receipt	06/10/2023 08:38

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Benzo(k)fluoranthene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A
Biphenyl	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
bis(2-Chloroethoxy)methane	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
bis(2-Chloroethyl)ether	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
bis(2-Chloroisopropyl)ether	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
bis(2-Ethylhexyl)phthalate	6510		ug/kg	425	SW846 8270D	5	06/17/2023 05:56	M1O	A
Butylbenzylphthalate	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
Caprolactam	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
Carbazole	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
Chrysene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A
Dibenzo(a,h)anthracene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A
Dibenzofuran	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
Diethylphthalate	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
Dimethylphthalate	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
Di-n-Butylphthalate	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
Di-n-Octylphthalate	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
Fluoranthene	3790		ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A
Fluorene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A
Hexachlorobenzene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
Hexachlorobutadiene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
Hexachlorocyclopentadiene	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
Hexachloroethane	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
Indeno(1,2,3-cd)pyrene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A
Isophorone	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
mp-Cresol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
Naphthalene	92.0		ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A
Nitrobenzene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
N-Nitroso-di-n-propylamine	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
N-Nitrosodiphenylamine	128		ug/kg	85.0	SW846 8270D	1	06/14/2023 18:52	S7M	A
o-Cresol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
Pentachlorophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
Phenanthrene	569		ug/kg	42.5	SW846 8270D	1	06/14/2023 18:52	S7M	A
Phenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 18:52	S7M	A
Pyrene	6780		ug/kg	213	SW846 8270D	5	06/17/2023 05:56	M1O	A

Project AB56400
Workorder 3307496



Results

Client Sample ID	AB56400-02	Collected	05/31/2023 10:50
Lab Sample ID	3307496002	Lab Receipt	06/10/2023 08:38

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
<i>SURROGATES</i>									
Compound	CAS No			Recovery	Limits(%)		Analysis Date/Time		Qualifiers
2,4,6-Tribromophenol	118-79-6			59.6%	19 – 132		06/14/2023 18:52		
2,4,6-Tribromophenol	118-79-6			55.2%	19 – 132		06/17/2023 05:56		
2-Fluorobiphenyl	321-60-8			53%	40 – 110		06/14/2023 18:52		
2-Fluorobiphenyl	321-60-8			57.8%	40 – 110		06/17/2023 05:56		
2-Fluorophenol	367-12-4			27.7%	26 – 116		06/14/2023 18:52		
2-Fluorophenol	367-12-4			30%	26 – 116		06/17/2023 05:56		
Nitrobenzene-d5	4165-60-0			64%	38 – 112		06/14/2023 18:52		
Nitrobenzene-d5	4165-60-0			53.5%	38 – 112		06/17/2023 05:56		
Phenol-d5	4165-62-2			32.7*%	35 – 111		06/14/2023 18:52		3
Phenol-d5	4165-62-2			38.8%	35 – 111		06/17/2023 05:56		
Terphenyl-d14	98904-43-9			69.1%	45 – 126		06/14/2023 18:52		
Terphenyl-d14	98904-43-9			60%	45 – 126		06/17/2023 05:56		

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Moisture	0.3		%	0.1	S2540G-11	1	06/12/2023 12:43	SXS	A
Total Solids	99.7	2	%	0.1	S2540G-11	1	06/12/2023 12:43	SXS	A

Project AB56400
Workorder 3307496



Results

Client Sample ID	AB56400-03	Collected	05/31/2023 11:30
Lab Sample ID	3307496003	Lab Receipt	06/10/2023 08:38

METALS

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND	mg/kg	1.5	SW846 6020B	5	06/22/2023 16:36	MO	D
Cadmium, Total	ND	ND	mg/kg	0.50	SW846 6020B	5	06/22/2023 16:36	MO	D
Chromium, Total	2.4		mg/kg	1.0	SW846 6020B	5	06/22/2023 16:36	MO	D
Iron, Total	554		mg/kg	25.0	SW846 6020B	5	06/22/2023 16:36	MO	D
Lead, Total	9.0		mg/kg	1.0	SW846 6020B	5	06/22/2023 16:36	MO	D
Manganese, Total	5.0		mg/kg	2.5	SW846 6020B	5	06/22/2023 16:36	MO	D
Mercury, Total	ND	ND	mg/kg	0.047	SW846 7471B	1	06/14/2023 11:42	JSE	A
Selenium, Total	ND	ND,4	mg/kg	2.5	SW846 6020B	5	06/22/2023 16:36	MO	D
Zinc, Total	10900		mg/kg	250	SW846 6020B	500	06/22/2023 16:46	MO	D

SEMIVOLATILES

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
1,2,4,5-Tetrachlorobenzene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
1,4-Dioxane	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
2,3,4,6-Tetrachlorophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
2,4,5-Trichlorophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
2,4,6-Trichlorophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
2,4-Dichlorophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
2,4-Dimethylphenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
2,4-Dinitrophenol	ND	ND	ug/kg	340	SW846 8270D	1	06/14/2023 19:18	S7M	A
2,4-Dinitrotoluene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
2,6-Dinitrotoluene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
2-Chloronaphthalene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
2-Chlorophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
2-Methyl-4,6-dinitrophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
2-Methylnaphthalene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
2-Nitroaniline	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
2-Nitrophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
3,3-Dichlorobenzidine	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
3-Nitroaniline	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
4-Bromophenyl-phenylether	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
4-Chloro-3-methylphenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
4-Chloroaniline	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
4-Chlorophenyl-phenylether	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
4-Nitroaniline	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
4-Nitrophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
Acenaphthene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A
Acenaphthylene	76.3		ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A
Acetophenone	146		ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
Anthracene	113		ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A
Atrazine	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
Benzaldehyde	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
Benzo(a)anthracene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A
Benzo(a)pyrene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A
Benzo(b)fluoranthene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A
Benzo(g,h,i)perylene	1290		ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A

Project AB56400
Workorder 3307496



Results

Client Sample ID	AB56400-03	Collected	05/31/2023 11:30
Lab Sample ID	3307496003	Lab Receipt	06/10/2023 08:38

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Benzo(k)fluoranthene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A
Biphenyl	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
bis(2-Chloroethoxy)methane	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
bis(2-Chloroethyl)ether	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
bis(2-Chloroisopropyl)ether	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
bis(2-Ethylhexyl)phthalate	5070		ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
Butylbenzylphthalate	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
Caprolactam	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
Carbazole	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
Chrysene	1780		ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A
Dibenzo(a,h)anthracene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A
Dibenzofuran	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
Diethylphthalate	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
Dimethylphthalate	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
Di-n-Butylphthalate	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
Di-n-Octylphthalate	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
Fluoranthene	4650		ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A
Fluorene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A
Hexachlorobenzene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
Hexachlorobutadiene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
Hexachlorocyclopentadiene	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
Hexachloroethane	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
Indeno(1,2,3-cd)pyrene	ND	ND	ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A
Isophorone	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
mp-Cresol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
Naphthalene	88.9		ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A
Nitrobenzene	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
N-Nitroso-di-n-propylamine	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
N-Nitrosodiphenylamine	ND	ND	ug/kg	85.0	SW846 8270D	1	06/14/2023 19:18	S7M	A
o-Cresol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
Pentachlorophenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
Phenanthrene	717		ug/kg	42.5	SW846 8270D	1	06/14/2023 19:18	S7M	A
Phenol	ND	ND	ug/kg	170	SW846 8270D	1	06/14/2023 19:18	S7M	A
Pyrene	7110		ug/kg	425	SW846 8270D	10	06/20/2023 09:44	S7M	A

Project AB56400
Workorder 3307496



Results

Client Sample ID	AB56400-03	Collected	05/31/2023 11:30
Lab Sample ID	3307496003	Lab Receipt	06/10/2023 08:38

SEMIVOLATILES (cont.)

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
<i>SURROGATES</i>									
Compound	CAS No			Recovery	Limits(%)		Analysis Date/Time		Qualifiers
2,4,6-Tribromophenol	118-79-6			59.1%	19 – 132		06/20/2023 09:44		
2,4,6-Tribromophenol	118-79-6			59.7%	19 – 132		06/14/2023 19:18		
2-Fluorobiphenyl	321-60-8			59%	40 – 110		06/20/2023 09:44		
2-Fluorobiphenyl	321-60-8			59.5%	40 – 110		06/14/2023 19:18		
2-Fluorophenol	367-12-4			21.1*%	26 – 116		06/20/2023 09:44		5
2-Fluorophenol	367-12-4			23.9*%	26 – 116		06/14/2023 19:18		6
Nitrobenzene-d5	4165-60-0			49.8%	38 – 112		06/20/2023 09:44		
Nitrobenzene-d5	4165-60-0			52.2%	38 – 112		06/14/2023 19:18		
Phenol-d5	4165-62-2			29.1*%	35 – 111		06/20/2023 09:44		8
Phenol-d5	4165-62-2			29.9*%	35 – 111		06/14/2023 19:18		7
Terphenyl-d14	98904-43-9			57.2%	45 – 126		06/20/2023 09:44		
Terphenyl-d14	98904-43-9			65.1%	45 – 126		06/14/2023 19:18		

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Moisture	0.3		%	0.1	S2540G-11	1	06/12/2023 12:43	SXS	A
Total Solids	99.7	2	%	0.1	S2540G-11	1	06/12/2023 12:43	SXS	A

Project **AB56400**
Workorder **3307496**



Sample - Method Cross Reference Table

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3307496001	AB56400-01	SW846 6020B	SW846 3051A	
		SW846 7471B	SW846 7471B	
		SW846 8270D	SW846 3546	
		S2540G-11	N/A	
3307496002	AB56400-02	SW846 6020B	SW846 3051A	
		SW846 7471B	SW846 7471B	
		SW846 8270D	SW846 3546	
		S2540G-11	N/A	
3307496003	AB56400-03	SW846 6020B	SW846 3051A	
		SW846 7471B	SW846 7471B	
		SW846 8270D	SW846 3546	
		S2540G-11	N/A	



Project AB56400
Workorder 3307496

QUALITY CONTROL SAMPLES

METALS

QC Batch

<u>QC Batch</u>	1014323	<u>Prep Method</u>	SW846 7471B
<u>Date</u>	06/14/2023 09:05	<u>Analysis Method</u>	SW846 7471B
<u>Tech.</u>	WDA		

Associated Samples

3307496001	3307496002	3307496003
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Matrix Spike 3682329 (MS) 3307840001 (non-Project Sample) For QC Batch 1014323

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Matrix Spike Duplicate 3682330 (MSD) 3307840001 (non-Project Sample) For QC Batch 1014323

RESULTS

Compound	CAS No		Result (mg/kg)	Orig. Result (mg/kg)	Spk Added (mg/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Mercury, Total	7439-97-6	MS	0.71	0.0690	0.87	73.4*	80 - 120		
Mercury, Total	7439-97-6	MSD	0.78	0.0690	0.93	76.2*	80 - 120	RPD <u>9.48</u> (Max-20)	

Method Blank 3682325 (MB) Created on 06/14/2023 06:29 For QC Batch 1014323

RESULTS

Compound	CAS No		Result	Units	RDL	Qualifiers
Mercury, Total	7439-97-6	BLK	ND	mg/kg	0.050	ND

Lab Control Standard 3682326 (LCS) Created on 06/14/2023 06:29 For QC Batch 1014323

RESULTS

Compound	CAS No		Result (mg/kg)	Orig. Result (mg/kg)	Spk Added (mg/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Mercury, Total	7439-97-6	LCS	0.38		0.40	94.5	80 - 120		

Matrix Spike 3682327 (MS) 3307496001 For QC Batch 1014323

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Matrix Spike Duplicate 3682328 (MSD) 3307496001 For QC Batch 1014323

RESULTS

Compound	CAS No		Result (mg/kg)	Orig. Result (mg/kg)	Spk Added (mg/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Mercury, Total	7439-97-6	MS	0.93	0.0023	0.98	94.8	80 - 120		
Mercury, Total	7439-97-6	MSD	0.90	0.0023	0.99	90.8	80 - 120	RPD <u>3.12</u> (Max-20)	

Project AB56400
Workorder 3307496



QUALITY CONTROL SAMPLES

METALS (cont.)

QC Batch

QC Batch 1018245 Prep Method SW846 3051A
 Date 06/21/2023 10:50 Analysis Method SW846 6020B
 Tech. JSE

Associated Samples

3307496001

Matrix Spike 3685527 (MS) 3308207001 (non-Project Sample) For QC Batch 1018245

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Matrix Spike Duplicate 3685528 (MSD) 3308207001 (non-Project Sample) For QC Batch 1018245

RESULTS

Compound	CAS No		Result (mg/kg)	Orig. Result (mg/kg)	Spk Added (mg/kg)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Arsenic, Total	7440-38-2	MS	21.80	5.30	19.30	85.9	75 - 125		
Arsenic, Total	7440-38-2	MSD	23.60	5.30	19.50	93.9	75 - 125	RPD 7.89 (Max-20)	
Cadmium, Total	7440-43-9	MS	18.80	0.19	19.30	96.6	75 - 125		
Cadmium, Total	7440-43-9	MSD	19.20	0.19	19.50	97.3	75 - 125	RPD 2.04 (Max-20)	
Chromium, Total	7440-47-3	MS	42.10	23.60	19.30	96	75 - 125		
Chromium, Total	7440-47-3	MSD	48.60	23.60	19.50	128*	75 - 125	RPD 14.40 (Max-20)	
Iron, Total	7439-89-6	MS	23500	20800	193	NC	75 - 125		
Iron, Total	7439-89-6	MSD	30400	20800	195	NC	75 - 125	RPD 25.30* (Max-20)	
Lead, Total	7439-92-1	MS	35	16.70	19.30	95.1	75 - 125		
Lead, Total	7439-92-1	MSD	40.50	16.70	19.50	122	75 - 125	RPD 14.50 (Max-20)	
Manganese, Total	7439-96-5	MS	509	618	19.30	NC	75 - 125		
Manganese, Total	7439-96-5	MSD	682	618	19.50	NC	75 - 125	RPD 29* (Max-20)	
Selenium, Total	7782-49-2	MS	17	0.64	19.30	84.8	75 - 125		
Selenium, Total	7782-49-2	MSD	17.40	0.64	19.50	85.7	75 - 125	RPD 2.37 (Max-20)	
Zinc, Total	7440-66-6	MS	226	55.60	193	88.7	75 - 125		
Zinc, Total	7440-66-6	MSD	237	55.60	195	92.9	75 - 125	RPD 4.59 (Max-20)	

Method Blank 3685525 (MB) Created on 06/21/2023 08:36 For QC Batch 1018245

RESULTS

Compound	CAS No		Result	Units	RDL	Qualifiers
Arsenic, Total	7440-38-2	BLK	ND	mg/kg	1.5	ND
Cadmium, Total	7440-43-9	BLK	ND	mg/kg	0.50	ND
Chromium, Total	7440-47-3	BLK	ND	mg/kg	1.0	ND
Iron, Total	7439-89-6	BLK	ND	mg/kg	25.0	ND
Lead, Total	7439-92-1	BLK	ND	mg/kg	1.0	ND
Manganese, Total	7439-96-5	BLK	ND	mg/kg	2.5	ND
Selenium, Total	7782-49-2	BLK	ND	mg/kg	2.5	ND
Zinc, Total	7440-66-6	BLK	ND	mg/kg	2.5	ND

Project AB56400
Workorder 3307496



QUALITY CONTROL SAMPLES

METALS (cont.)

Lab Control Standard 3685526 (LCS) Created on 06/21/2023 08:36 For QC Batch 1018245

RESULTS

<u>Compound</u>	<u>CAS No</u>		<u>Result</u> (mg/kg)	<u>Orig.</u> <u>Result</u> (mg/kg)	<u>Spk</u> <u>Added</u> (mg/kg)	<u>Rec.</u> (%)	<u>Limits (%)</u>	<u>RPD Limit (%)</u>	<u>Qualifiers</u>
Arsenic, Total	7440-38-2	LCS	19.30		20	96.6	80 - 120		
Cadmium, Total	7440-43-9	LCS	19.50		20	97.7	80 - 120		
Chromium, Total	7440-47-3	LCS	19.40		20	97	80 - 120		
Iron, Total	7439-89-6	LCS	192		200	96.2	80 - 120		
Lead, Total	7439-92-1	LCS	20.50		20	102	80 - 120		
Manganese, Total	7439-96-5	LCS	19.50		20	97.6	80 - 120		
Selenium, Total	7782-49-2	LCS	19.40		20	97.2	80 - 120		
Zinc, Total	7440-66-6	LCS	196		200	98.2	80 - 120		



Project AB56400
Workorder 3307496

QUALITY CONTROL SAMPLES

SEMIVOLATILES

QC Batch

<u>QC Batch</u>	1013675	<u>Prep Method</u>	SW846 3546
<u>Date</u>	06/13/2023 17:00	<u>Analysis Method</u>	SW846 8270D
<u>Tech.</u>	J1H		

Associated Samples

3307496001	3307496002	3307496003
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Method Blank

3681935 (MB)

Created on 06/13/2023 10:20

For QC Batch 1013675

RESULTS

Compound	CAS No		Result	Units	RDL	Qualifiers
1,2,4,5-Tetrachlorobenzene	95-94-3	BLK	ND	ug/kg	100	ND
1,4-Dioxane	123-91-1	BLK	ND	ug/kg	100	ND
2,3,4,6-Tetrachlorophenol	58-90-2	BLK	ND	ug/kg	200	ND
2,4,5-Trichlorophenol	95-95-4	BLK	ND	ug/kg	200	ND
2,4,6-Trichlorophenol	88-06-2	BLK	ND	ug/kg	200	ND
2,4-Dichlorophenol	120-83-2	BLK	ND	ug/kg	200	ND
2,4-Dimethylphenol	105-67-9	BLK	ND	ug/kg	200	ND
2,4-Dinitrophenol	51-28-5	BLK	ND	ug/kg	400	ND
2,4-Dinitrotoluene	121-14-2	BLK	ND	ug/kg	100	ND
2,6-Dinitrotoluene	606-20-2	BLK	ND	ug/kg	100	ND
2-Chloronaphthalene	91-58-7	BLK	ND	ug/kg	100	ND
2-Chlorophenol	95-57-8	BLK	ND	ug/kg	200	ND
2-Methyl-4,6-dinitrophenol	534-52-1	BLK	ND	ug/kg	200	ND
2-Methylnaphthalene	91-57-6	BLK	ND	ug/kg	100	ND
2-Nitroaniline	88-74-4	BLK	ND	ug/kg	200	ND
2-Nitrophenol	88-75-5	BLK	ND	ug/kg	200	ND
3,3-Dichlorobenzidine	91-94-1	BLK	ND	ug/kg	200	ND
3-Nitroaniline	99-09-2	BLK	ND	ug/kg	200	ND
4-Bromophenyl-phenylether	101-55-3	BLK	ND	ug/kg	100	ND
4-Chloro-3-methylphenol	59-50-7	BLK	ND	ug/kg	200	ND
4-Chloroaniline	106-47-8	BLK	ND	ug/kg	200	ND
4-Chlorophenyl-phenylether	7005-72-3	BLK	ND	ug/kg	100	ND
4-Nitroaniline	100-01-6	BLK	ND	ug/kg	200	ND
4-Nitrophenol	100-02-7	BLK	ND	ug/kg	200	ND
Acenaphthene	83-32-9	BLK	ND	ug/kg	50.0	ND
Acenaphthylene	208-96-8	BLK	ND	ug/kg	50.0	ND
Acetophenone	98-86-2	BLK	ND	ug/kg	100	ND
Anthracene	120-12-7	BLK	ND	ug/kg	50.0	ND
Atrazine	1912-24-9	BLK	ND	ug/kg	100	ND
Benzaldehyde	100-52-7	BLK	ND	ug/kg	200	ND
Benzo(a)anthracene	56-55-3	BLK	ND	ug/kg	50.0	ND
Benzo(a)pyrene	50-32-8	BLK	ND	ug/kg	50.0	ND
Benzo(b)fluoranthene	205-99-2	BLK	ND	ug/kg	50.0	ND
Benzo(g,h,i)perylene	191-24-2	BLK	ND	ug/kg	50.0	ND
Benzo(k)fluoranthene	207-08-9	BLK	ND	ug/kg	50.0	ND
Biphenyl	92-52-4	BLK	ND	ug/kg	100	ND
bis(2-Chloroethoxy)methane	111-91-1	BLK	ND	ug/kg	100	ND
bis(2-Chloroethyl)ether	111-44-4	BLK	ND	ug/kg	100	ND
bis(2-Chloroisopropyl)ether	108-60-1	BLK	ND	ug/kg	100	ND

Project AB56400
Workorder 3307496



QUALITY CONTROL SAMPLES

SEMIVOLATILES (cont.)

RESULTS

Compound	CAS No		Result	Units	RDL	Qualifiers
bis(2-Ethylhexyl)phthalate	117-81-7	BLK	ND	ug/kg	100	ND
Butylbenzylphthalate	85-68-7	BLK	ND	ug/kg	100	ND
Caprolactam	105-60-2	BLK	ND	ug/kg	200	ND
Carbazole	86-74-8	BLK	ND	ug/kg	100	ND
Chrysene	218-01-9	BLK	ND	ug/kg	50.0	ND
Dibenzo(a,h)anthracene	53-70-3	BLK	ND	ug/kg	50.0	ND
Dibenzofuran	132-64-9	BLK	ND	ug/kg	100	ND
Diethylphthalate	84-66-2	BLK	ND	ug/kg	100	ND
Dimethylphthalate	131-11-3	BLK	ND	ug/kg	100	ND
Di-n-Butylphthalate	84-74-2	BLK	ND	ug/kg	100	ND
Di-n-Octylphthalate	117-84-0	BLK	ND	ug/kg	100	ND
Fluoranthene	206-44-0	BLK	ND	ug/kg	50.0	ND
Fluorene	86-73-7	BLK	ND	ug/kg	50.0	ND
Hexachlorobenzene	118-74-1	BLK	ND	ug/kg	100	ND
Hexachlorobutadiene	87-68-3	BLK	ND	ug/kg	100	ND
Hexachlorocyclopentadiene	77-47-4	BLK	ND	ug/kg	200	ND
Hexachloroethane	67-72-1	BLK	ND	ug/kg	100	ND
Indeno(1,2,3-cd)pyrene	193-39-5	BLK	ND	ug/kg	50.0	ND
Isophorone	78-59-1	BLK	ND	ug/kg	100	ND
m-Cresol	108394/106445	BLK	ND	ug/kg	200	ND
Naphthalene	91-20-3	BLK	ND	ug/kg	50.0	ND
Nitrobenzene	98-95-3	BLK	ND	ug/kg	100	ND
N-Nitroso-di-n-propylamine	621-64-7	BLK	ND	ug/kg	100	ND
N-Nitrosodiphenylamine	86-30-6	BLK	ND	ug/kg	100	ND
o-Cresol	95-48-7	BLK	ND	ug/kg	200	ND
Pentachlorophenol	87-86-5	BLK	ND	ug/kg	200	ND
Phenanthrene	85-01-8	BLK	ND	ug/kg	50.0	ND
Phenol	108-95-2	BLK	ND	ug/kg	200	ND
Pyrene	129-00-0	BLK	ND	ug/kg	50.0	ND

SURROGATES

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
2,4,6-Tribromophenol	118-79-6	BLK	4290	5000	85.7	19 - 132	
2-Fluorobiphenyl	321-60-8	BLK	2300	2500	92.1	40 - 110	
2-Fluorophenol	367-12-4	BLK	3880	5000	77.6	26 - 116	
Nitrobenzene-d5	4165-60-0	BLK	2220	2500	88.8	38 - 112	
Phenol-d5	4165-62-2	BLK	3860	5000	77.2	35 - 111	
Terphenyl-d14	98904-43-9	BLK	2610	2500	104	45 - 126	

Lab Control Standard

3681936 (LCS)

Created on 06/13/2023 10:20

For QC Batch 1013675

RESULTS

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)	Spk Added (ug/L)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
1,2,4,5-Tetrachlorobenzene	95-94-3	LCS	2070		2500	82.7	56 - 107		



Project AB56400
Workorder 3307496

QUALITY CONTROL SAMPLES

SEMIVOLATILES (cont.)

RESULTS

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)	Spk Added (ug/L)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
1,4-Dioxane	123-91-1	LCS	1550		2500	62	37 - 98		
2,3,4,6-Tetrachlorophenol	58-90-2	LCS	4320		5000	86.5	60 - 111		
2,4,5-Trichlorophenol	95-95-4	LCS	4750		5000	95.1	68 - 121		
2,4,6-Trichlorophenol	88-06-2	LCS	4940		5000	98.8	68 - 119		
2,4-Dichlorophenol	120-83-2	LCS	4570		5000	91.5	65 - 111		
2,4-Dimethylphenol	105-67-9	LCS	4700		5000	94	65 - 114		
2,4-Dinitrophenol	51-28-5	LCS	4360		5000	87.2	36 - 131		
2,4-Dinitrotoluene	121-14-2	LCS	2060		2500	82.4	61 - 117		
2,6-Dinitrotoluene	606-20-2	LCS	2160		2500	86.5	61 - 115		
2-Chloronaphthalene	91-58-7	LCS	2170		2500	86.7	55 - 111		
2-Chlorophenol	95-57-8	LCS	4180		5000	83.7	61 - 111		
2-Methyl-4,6-dinitrophenol	534-52-1	LCS	4750		5000	95.1	53 - 131		
2-Methylnaphthalene	91-57-6	LCS	2130		2500	85.4	58 - 96		
2-Nitroaniline	88-74-4	LCS	1960		2500	78.4	61 - 120		
2-Nitrophenol	88-75-5	LCS	4560		5000	91.1	61 - 114		
3,3-Dichlorobenzidine	91-94-1	LCS	3390		5000	67.7	27 - 106		
3-Nitroaniline	99-09-2	LCS	2270		2500	90.8	52 - 115		
4-Bromophenyl-phenylether	101-55-3	LCS	2300		2500	92.2	60 - 111		
4-Chloro-3-methylphenol	59-50-7	LCS	4250		5000	85	65 - 118		
4-Chloroaniline	106-47-8	LCS	1990		2500	79.5	21 - 115		
4-Chlorophenyl-phenylether	7005-72-3	LCS	2190		2500	87.7	58 - 112		
4-Nitroaniline	100-01-6	LCS	2300		2500	92.1	50 - 106		
4-Nitrophenol	100-02-7	LCS	3640		5000	72.9	49 - 134		
Acenaphthene	83-32-9	LCS	2110		2500	84.2	59 - 115		
Acenaphthylene	208-96-8	LCS	2150		2500	86.2	59 - 114		
Acetophenone	98-86-2	LCS	1550		2500	62.1	45 - 87		
Anthracene	120-12-7	LCS	2270		2500	90.8	63 - 112		
Atrazine	1912-24-9	LCS	2400		2500	95.9	54 - 128		
Benzaldehyde	100-52-7	LCS	1710		2500	68.5	52 - 108		
Benzo(a)anthracene	56-55-3	LCS	2250		2500	90	61 - 118		
Benzo(a)pyrene	50-32-8	LCS	2490		2500	99.6	61 - 114		
Benzo(b)fluoranthene	205-99-2	LCS	2210		2500	88.5	64 - 113		
Benzo(g,h,i)perylene	191-24-2	LCS	2230		2500	89.4	61 - 118		
Benzo(k)fluoranthene	207-08-9	LCS	2350		2500	94.2	62 - 113		
Biphenyl	92-52-4	LCS	1910		2500	76.5	60 - 111		
bis(2-Chloroethoxy)methane	111-91-1	LCS	2070		2500	82.8	56 - 108		
bis(2-Chloroethyl)ether	111-44-4	LCS	1810		2500	72.4	51 - 105		
bis(2-Chloroisopropyl)ether	108-60-1	LCS	2000		2500	80	34 - 126		
bis(2-Ethylhexyl)phthalate	117-81-7	LCS	1900		2500	76	51 - 126		
Butylbenzylphthalate	85-68-7	LCS	2160		2500	86.6	56 - 126		
Caprolactam	105-60-2	LCS	2110		2500	84.6	38 - 129		
Carbazole	86-74-8	LCS	2380		2500	95.1	65 - 117		
Chrysene	218-01-9	LCS	2220		2500	88.7	63 - 111		
Dibenzo(a,h)anthracene	53-70-3	LCS	2260		2500	90.5	64 - 117		
Dibenzofuran	132-64-9	LCS	2240		2500	89.8	61 - 111		
Diethylphthalate	84-66-2	LCS	2160		2500	86.6	59 - 112		
Dimethylphthalate	131-11-3	LCS	2240		2500	89.5	59 - 111		



Project AB56400
Workorder 3307496

QUALITY CONTROL SAMPLES

SEMIVOLATILES (cont.)

RESULTS

Compound	CAS No		<u>Result</u> (ug/L)	<u>Orig.</u> <u>Result</u> (ug/L)	<u>Spk</u> <u>Added</u> (ug/L)	<u>Rec.</u> (%)	<u>Limits (%)</u>	<u>RPD Limit (%)</u>	<u>Qualifiers</u>
Di-n-Butylphthalate	84-74-2	LCS	2460		2500	98.5	58 - 118		
Di-n-Octylphthalate	117-84-0	LCS	2170		2500	86.9	45 - 128		
Fluoranthene	206-44-0	LCS	2370		2500	94.9	61 - 116		
Fluorene	86-73-7	LCS	2170		2500	86.6	61 - 112		
Hexachlorobenzene	118-74-1	LCS	2430		2500	97.3	59 - 109		
Hexachlorobutadiene	87-68-3	LCS	2620		2500	105	58 - 123		
Hexachlorocyclopentadiene	77-47-4	LCS	1820		2500	72.7	33 - 109		
Hexachloroethane	67-72-1	LCS	1870		2500	74.7	50 - 103		
Indeno(1,2,3-cd)pyrene	193-39-5	LCS	2220		2500	88.7	62 - 113		
Isophorone	78-59-1	LCS	1760		2500	70.3	51 - 112		
mp-Cresol	108394/106445	LCS	4050		5000	80.9	60 - 112		
Naphthalene	91-20-3	LCS	2130		2500	85.3	56 - 105		
Nitrobenzene	98-95-3	LCS	1980		2500	79.2	53 - 108		
N-Nitroso-di-n-propylamine	621-64-7	LCS	1850		2500	74.2	55 - 109		
N-Nitrosodiphenylamine	86-30-6	LCS	2610		2500	104	65 - 134		
o-Cresol	95-48-7	LCS	4010		5000	80.1	62 - 113		
Pentachlorophenol	87-86-5	LCS	5250		5000	105	60 - 145		
Phenanthrene	85-01-8	LCS	2270		2500	90.6	62 - 109		
Phenol	108-95-2	LCS	3960		5000	79.2	53 - 118		
Pyrene	129-00-0	LCS	2190		2500	87.6	60 - 114		

SURROGATES

Compound	CAS No		<u>Result</u> (ug/L)	<u>Expected</u> (ug/L)	<u>Rec.</u> (%)	<u>Limits (%)</u>	<u>Qualifiers</u>
2,4,6-Tribromophenol	118-79-6	LCS	4870	5000	97.4	19 - 132	
2-Fluorobiphenyl	321-60-8	LCS	2180	2500	87.2	40 - 110	
2-Fluorophenol	367-12-4	LCS	4040	5000	80.8	26 - 116	
Nitrobenzene-d5	4165-60-0	LCS	2260	2500	90.3	38 - 112	
Phenol-d5	4165-62-2	LCS	3970	5000	79.4	35 - 111	
Terphenyl-d14	98904-43-9	LCS	2430	2500	97.2	45 - 126	



Project AB56400
Workorder 3307496

QUALITY CONTROL SAMPLES

WET CHEMISTRY

QC Batch

<u>QC Batch</u>	1013531	<u>Prep Method</u>	N/A
<u>Date</u>	N/A	<u>Analysis Method</u>	S2540G-11
<u>Tech.</u>			

Associated Samples

3307496001	3307496002	3307496003
------------	------------	------------

Duplicate 3681436 (DUP) 3307390002 (non-Project Sample) For QC Batch 1013531

****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

RESULTS

Compound	CAS No		<u>Result</u> (%)	<u>Orig. Result</u> (%)			<u>Qualifiers</u>
Moisture	MOISTURE	DUP	11.0653	11.7581	RPD	<u>6.07</u>	(Max-10)
Total Solids	TSP	DUP	88.9346	88.2418	RPD	<u>0.78</u>	(Max-5)

Duplicate 3681437 (DUP) 3307420001 (non-Project Sample) For QC Batch 1013531

****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

RESULTS

Compound	CAS No		<u>Result</u> (%)	<u>Orig. Result</u> (%)			<u>Qualifiers</u>
Moisture	MOISTURE	DUP	9.1390	7.8884	RPD	<u>14.70*</u>	(Max-10)
Total Solids	TSP	DUP	90.8609	92.1115	RPD	<u>1.37</u>	(Max-5)

Duplicate 3681438 (DUP) 3307422005 (non-Project Sample) For QC Batch 1013531

****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

RESULTS

Compound	CAS No		<u>Result</u> (%)	<u>Orig. Result</u> (%)			<u>Qualifiers</u>
Moisture	MOISTURE	DUP	21.9222	23.6248	RPD	<u>7.48</u>	(Max-10)
Total Solids	TSP	DUP	78.0777	76.3751	RPD	<u>2.20</u>	(Max-5)

Duplicate 3681439 (DUP) 3307449004 (non-Project Sample) For QC Batch 1013531

****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

Project AB56400
Workorder 3307496



QUALITY CONTROL SAMPLES

WET CHEMISTRY (cont.)

RESULTS

Compound	CAS No		Result (%)	Orig. Result (%)			Qualifiers
Moisture	MOISTURE	DUP	75.5467	75.0289	RPD	0.69	(Max-10)
Total Solids	TSP	DUP	24.4532	24.9710	RPD	2.10	(Max-5)

Duplicate 3681440 (DUP) 3307455010 (non-Project Sample) For QC Batch 1013531

****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

RESULTS

Compound	CAS No		Result (%)	Orig. Result (%)			Qualifiers
Moisture	MOISTURE	DUP	26.1561	27.7160	RPD	5.79	(Max-10)
Total Solids	TSP	DUP	73.8438	72.2839	RPD	2.13	(Max-5)

Duplicate 3681441 (DUP) 3307524001 (non-Project Sample) For QC Batch 1013531

****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

RESULTS

Compound	CAS No		Result (%)	Orig. Result (%)			Qualifiers
Moisture	MOISTURE	DUP	96.6371	96.7196	RPD	0.09	(Max-10)
Total Solids	TSP	DUP	3.3628	3.2803	RPD	2.48	(Max-5)

Duplicate 3681585 (DUP) 3307367001 (non-Project Sample) For QC Batch 1013531

****NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

RESULTS

Compound	CAS No		Result (%)	Orig. Result (%)			Qualifiers
Moisture	MOISTURE	DUP	84.8006	84.7762	RPD	0.03	(Max-10)
Total Solids	TSP	DUP	15.1993	15.2237	RPD	0.16	(Max-5)

Project AB56400
Workorder 3307496



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Preparation Method	Prep Batch	Prep Date/Time	By	Analysis Method	Anly Batch
3307496001	AB56400-01	SW846 3051A	1018245	06/21/2023 10:50	JSE	SW846 6020B	1018369
		SW846 7471B	1014323	06/14/2023 09:05	WDA	SW846 7471B	1014708
		SW846 3546	1013675	06/13/2023 17:00	J1H	SW846 8270D	1014764
		SW846 3546	1013675	06/13/2023 17:00	J1H	SW846 8270D	1017844
		N/A	N/A	N/A		S2540G-11	1013531
3307496002	AB56400-02	SW846 3051A	1019142	06/22/2023 13:30	MEM	SW846 6020B	1019309
		SW846 7471B	1014323	06/14/2023 09:05	WDA	SW846 7471B	1014708
		SW846 3546	1013675	06/13/2023 17:00	J1H	SW846 8270D	1014764
		SW846 3546	1013675	06/13/2023 17:00	J1H	SW846 8270D	1017844
		N/A	N/A	N/A		S2540G-11	1013531
3307496003	AB56400-03	SW846 3051A	1019142	06/22/2023 13:30	MEM	SW846 6020B	1019309
		SW846 7471B	1014323	06/14/2023 09:05	WDA	SW846 7471B	1014708
		SW846 3546	1013675	06/13/2023 17:00	J1H	SW846 8270D	1017764
		SW846 3546	1013675	06/13/2023 17:00	J1H	SW846 8270D	1014764
		N/A	N/A	N/A		S2540G-11	1013531

6/22/2023 5:17 PM

EMSL Analytical, Inc.
Environmental Chemistry Lab Service
200 Route 130 North, Cinnaminson, NJ 08077
TEL: (856) 858-4800 FAX: (856) 786-5974

Chain of Custody / Analysis Request Form
Print ALL Information. Incomplete chain of custody could result in sample rejection.

EMSL Project # AB56400
Account Rep: ENVI54
Indicate State where samples were collected:
MA

REPORT RESULTS TO:

Name: Travis Albert **PO#:**

Company
EMSL Analytical, Inc.

Address: 200 Route 130 North

City: Cinnaminson

State: NJ **Zip:** 08077

Tel: 856-303-2548 ext. 2548 **Fax:** 856-854-2362

Email: sublab@emsl.com

SEND INVOICE TO:

Name: **PO#:**

Company
EMSL Analytical, Inc.

Address: 200 Route 130 North

City: Cinnaminson

State: NJ **Zip:** 08077

Tel: 800-220-3675 **Fax:** 856-854-2362

of Samples in Shipment: 3

3307496

Logged By: KSB
PM: SSL

7-day per Sarah Leung
Turnaround Time 5 Business Days
Due 6/16
Analytical Laboratory Services
301 Fulling Mill Rd
Middletown, PA 17057
717-944-5541

PROJECT NAME:

Date of Sample Shipment: 6/9/23

Sampled by: (Signature)

Sampled by: (Signature)					Matrix					Preservative				Sampling		List Method and Test Needed												
	Lab Sample Number	Client Sample ID	Comp	Grab	Waste WATER	SOIL	AIR	SLUDGE	OTHER	HCl	HNO3	Na2S2O3	ICE	DATE	TIME		SVOC	Metals 6010/7470										
1.	AB56400-01								X					5/31	10:15am		X	X										
2.	AB56400-02								X					5/31	10:50am		X	X										
3.	AB56400-03								X					5/31	11:30am		X	X										
4.																												
5.																												
6.																												

Temp By: KSB

WO Temp (°C) 2

Therm IF 570

Receipt Info Completed By: KSB

Cooler Custody Seal Intact

Sample Custody Seal Intact

Received on Ice

Cooler & Samples Intact

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Released By Signature

Date & Time Released

Delivery Method

Received By Signature

Agency

Date & Time Received

Condition

Colleen Palladino 6/9/23

FedEx

[Signature]

6.10.23 830

Please indicate reporting requirements: ☐ 1. Results Only ☒ 2. Results and QC ☐ 3. Reduced Deliverables ☐ 4. Disk Deliverable ☐ 5. Other

Comments: Please analyze for metals (As, Cd, Cr, Pb, Fe, Mn, Hg, Se, Zn) and SVOC 8270

Temp By: KSB
WO Temp (°C) 7
Therm ID 570

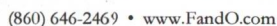
Receipt Info Completed By:
Cooler Custody Seal Intact
Sample Custody Seal Intact
Received on Ice
Cooler & Samples Intact
Correct Containers Provided
Sample Label/COC Agree
Adequate Sample Volumes
CR6 Samples Filtered
OP Samples Filtered
VOA Headspace Present
Voa Trip Blank
NLS 4 Days?
Rad Screen (uCi)
Courier/Tracking #:

SDWA Compliance
PWSID
WV Containers 0-6°C

KSB
Y N NA
Y N NA
Y N NA
Y N NA
Y N NA
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Y N NA
Y N NA

Table of Contents



□ 1419 Richland Street, Columbia, SC 29201

☐ 317 Iron Horse Way, Suite 204, Providence, RI 02908

☐ Other

41795

Turnaround

☐ Other _____ (days)

*Surcharge Applies

LABORATORY

EMSL (NT)

Containers

Analysis Request

Analysis Request

Analysis Request

SW=Surface Water ST=Stormwater W=Waste A=Air C=Concrete

Analysis Request

Analysis Request

Analysis Request

☐ 80 Washington Street, Suite 301, Poughkeepsie, NY

☐ Other

CHAIN-OF-CUSTODY RECORD 41795

Turnaround

☐ 24-Hour* ☐ 72-Hour* ☐ Other _____ (days)
☐ 48-Hour* ☒ Standard (____ days) *Surcharge Applies

PROJECT NAME

PROJECT LOCATION

PROJECT NUMBER

LABORATORY

PROJECT NAME
Needham Crumb Rubber

Needham, MA

70081266.B20

EMSL (NJ)

REPORT TO: Wendy Tramm wtramm@fardo.com

INVOICE TO:

P.O. No.: 17082008/266.B20

Sampler's Signature: [Signature] Date: 5/31/23

Source Codes:
 MW=Monitoring Well PW=Potable Water T=Treatment Facility S=Soil B=Sediment
 SW=Surface Water ST=Stormwater W=Waste A=Air C=Concrete

X=Other liquens CR = Crum Rubber

Analysis Request

Analysis Request

Containers

Soil	VOA	Vial	☐ methanol
Soil	VOA	Vial	☐ water ☐ Na ₂ SO ₄) ₂
Glass	Soil Container	(4)	oz
Other:			
Water	VOA	Vial	☐ As is ☐ HCl
Glass	Amber	() ml	☐ As is ☐ H ₂ O
Plastic - As is,	A	250 ml	☐ 500 ☐ 1000 ml
Plastic - H ₂ SO ₄ ,	A	250 ml	☐ 500 ml ☐ Filtered
Plastic - HNO ₃		250 ml	☐ 500 ml ☐ 0.45µ
Plastic - NaOH,		250 ml	☐

Comments

[illegible]

Transfer Number	Relinquished By	Accepted By	Date	Time	Charge Exceptions: ☐ CT Tax Exempt ☐ QA/QC ☐ Other _____ ☐ Duplicates ☐ Blanks (Item Nos: _____)
1	Eran Konciewicz				Reporting and Detection Limit Requirements: ☐ RCP Deliverables ☒ MCP CAM Cert.
2					Additional Comments:
3					
4					

Appendix B

Sampling Equipment

Sampling Equipment

Analyte	Description	Calibration
Volatile Organic Compounds (VOCs)	Ion Science Tiger Photoionization Detector	Calibrated by Rental Company Verified Prior to Use
Surface Temperature & Relative Humidity	TSI Q-Trak Air Quality Monitor	Verified Prior to Use

Appendix C

Field Data Sheets

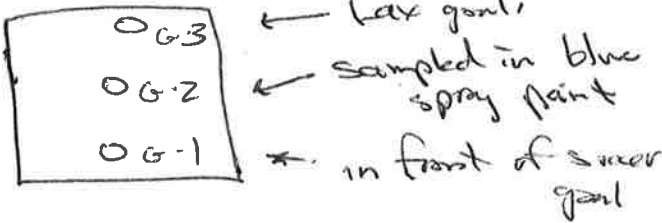
Crumb Rubber Sampling Field Data

Client/Project Name: Needham Crumb Rubber		 FUSS & O'NEILL
Project Location: Needham, MA	PROJECT #: 20081266.B40	
Sample#: 1708230531-01	<u>Sample Location ID</u> G-1, G-2, G-3	

Sample Location Description (include sketch map with location of sample)

N
 S

Brake Field



Sample Data

Sample Data	Container	Quantity	Preservative
Date: 05/31/2023 Time: 1015 Sampler: EK G-1 G-2 G-3 Weather: Ambient Temperature: 81.5°F 94.1 103.8 Relative Humidity: 37.7 25.0 16.7 Barometric Pressure: _____ Sampling Device: Auger / Core Sampler / Shovel <u>Trowel</u> / Other _____ Field decon: Yes <u>No</u> / Dedicated _____ Type of Sample: Grab <u>Composite</u> / Other _____ PID Reading (ppm): 0.0 / 0.0 / 0.2	4oz Amber	3	---

Description Data

Generic Sample Description: Crumb rubber	1015 G-1 1025 G-2 1035 G-3
--	----------------------------------

Comments:

Crumb Rubber Sampling Field Data

Client/Project Name: Needham Crumb Rubber		 FUSS & O'NEILL
Project Location: Needham, MA	PROJECT #: 20081266.B40	
Sample#: 1708230531-02	<u>Sample Location ID</u> G-4, G-5, G-6	

Sample Location Description (include sketch map with location of sample)

1^N Fondac field

06-6
 06-5
 06-4

← in front of soccer goal
 ← yellow paint
 ← Lax goal

Sample Data

Sample Data	Container	Quantity	Preservative
Date: 05/31/2023 Time: 1050 Sampler: EK <u>G-4</u> <u>G-5</u> <u>G-6</u> Weather: Ambient Temperature: <u>108.7</u> <u>95.6</u> <u>95.3</u> Relative Humidity: <u>13.4</u> <u>16.9</u> <u>19.8</u> Barometric Pressure: _____ Sampling Device: Auger / Core Sampler / Shovel / <u>Trowel</u> / Other _____ Field decon: Yes / <u>No</u> / Dedicated _____ Type of Sample: Grab / <u>Composite</u> / Other _____ PID Reading (ppm): <u>0.2</u> / <u>0.4</u> / <u>0.1</u>	4oz Amber	3	---

Description Data

Generic Sample Description: Crumb rubber 1050 G-4 1100 G-5 1110 G-6

Comments:

Crumb Rubber Sampling Field Data

Client/Project Name: Needham Crumb Rubber		 FUSS & O'NEILL
Project Location: Needham, MA	PROJECT #: 20081266.B40	
Sample#: 1708230531-03	<u>Sample Location ID</u> G-7, G-8, G-9	

Sample Location Description (include sketch map with location of sample)

N
 S

collected on white "P"

09 G-8 G-7

in blue "end zone"

collected from green grass

Sample Data

Sample Data	Container	Quantity	Preservative
Date: 05/31/2023 Time: 1130 Sampler: EK G-7 G-8 G-9 Weather: Ambient Temperature: 106.7 106.9 100.5 Relative Humidity: 8.8 12.9 6.9 Barometric Pressure: Sampling Device: Auger / Core Sampler / Shovel / <u>Trowel</u> / Other Field decon: Yes / <u>No</u> / Dedicated Type of Sample: Grab / <u>Composite</u> / Other PID Reading (ppm): 0.2 / 0.1 / 0.1	4oz Amber	3	

Description Data

Generic Sample Description: Crumb rubber

G-7 1130
 G-8 1140
 G-9 1150

Comments:



US Environmental Rental Corporation

(888) 550-8100

www.usenvironmental.com

166 Riverview Ave, Waltham, MA 02453 (781) 899-1560

91 Prestige Park Circle, Suite 5, East Hartford, CT 06108 (860) 289-8700

5C South Gold Dr, Hamilton, NJ 08691 (609) 570-8555

1202 Tech Blvd., Suite 108, Tampa, FL 33619 (813) 628-4200

Company: 1/0/1900

Contact: 0

Phone #: 0

Order No.: 0

Date: 5/30/2023

Technician: BP

Packing List

Item	Serial Number	Included	QC
Ion Science Tiger	1000-1384	✓	
Manual		✓	
Charger		✓	
Probe Tip		✓	
Alkaline Battery Pack		✓	
External Filters			
Software			
Comm. Cable			
Regulator		✓	
Tedlar Bag		✓	
Calibration Gas		✓	
Tube Holder			
Zero Tubes			

Calibration Report

Item	Information
Ion Science Tiger	1000-1384
Calibration Gas:	ISOBUTYLENE
Lot Number:	3.02402E+12
Span Setting:	100.00 ppm
Correction Factor:	1.00
Zero Reading:	0.00 ppm
Span Reading:	100.00 ppm
Post-Cal Bump Test:	100.20 ppm
Lamp	10.6 eV

This document certifies that US Environmental Rental Corporation has provided this rental equipment and all accessories in good working order. It is the renter's responsibility to: a) review all included items upon receipt, b) verify that all items are in acceptable condition and function properly, and c) contact a US Environmental associate immediately if any item is missing, damaged, and/or not functioning properly. Any delay in notifying US Environmental will be considered as the Renter taking responsibility for such missing, damaged, and/or malfunctioning item.

Missing, damaged, and/or malfunctioning equipment and accessories will result in additional fees.

166 Riverview Ave
Waltham, MA 02453
Phone: (781) 899-1560
Fax: (781) 894-1561

US Environmental Rental Corporation

Calibration record

Manufacturer: TSI

Model: IAQ Calc.

Serial number: 02020122

<u>Calibration gas</u>	<u>concentration</u>	<u>response</u>
------------------------	----------------------	-----------------

<u>CO2</u>	1000	1000
------------	------	------

<u>CO</u>	Failed sensor, no more available	
-----------	----------------------------------	--

<u>Humidity</u>		Passed
-----------------	--	--------

<u>Temperature</u>		Passed
--------------------	--	--------

Lot # 304-402469894-1

Exp. date 6/26

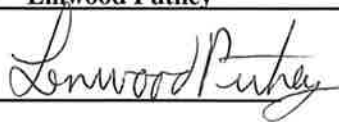
Alarms

Audible response: yes ____ no ____

Visual response: yes ____ no ____

Calibrated by Linwood Putney

Signature



Date 8/3/22



**Board of Health
TOWN OF NEEDHAM
AGENDA FACT SHEET**



MEETING DATE: July 14, 2023

Agenda Item	Needham Health Department Five Year Strategic Plan
Presenter(s)	Timothy McDonald, Health & Human Services Director Karen Contador, BME Strategies Bryan Murphy-Eustis, BME Strategies
1.	BRIEF DESCRIPTION OF TOPIC TO BE DISCUSSED
	Mr. McDonald and the BME Team will give an update on Needham Public Health Department's Five Year Strategic Plan.
2.	VOTE REQUIRED BY BOARD OF HEALTH
	No vote required.
3.	BACK UP INFORMATION: a. Needham Health Department Strategic Plan Kickoff b. Needham Strategic Planning Kickoff Meeting Summary c. June 27, 2023 Meeting Minutes

Needham Health Department

Strategic Plan Kickoff
Tuesday, June 27 2023

**BME Strategies
Copper Strategic
Needham Strategic Planning
Committee**

AGENDA

- Objectives for the Day
- Introductions
- Encouraged Behaviors
- Project Objectives
- Strategic Planning Committee
- Mission & Vision
- Meeting Close and Next Steps

Objectives for the Day

Objective 1 Introduce the
strategic planning
process

Objective 2 Affirm the
structure

Objective 3 Review mission
statement and discuss
vision and guiding
principles

Objective 4 Present next steps

INTRODUCTIONS

BME Strategies

Bryan Murphy-Eustis, *Executive Director*

Karen Contador, *Senior Public Health Consultant*

Meghan Russell, *Public Health Associate Consultant*

Copper Strategic

Chris Korsmo, *Co-founder*

Sara Morris, *Co-founder*

Needham Health Department

Diana Acosta, *Shared Services Manager*

Tara Gurge, *Assistant Director of Public Health*

Julie McCarthy, *Epidemiologist*

Tim McDonald, *Director of Health and Human Services*

Cindi Melanson, *Accreditation*

Lynn Schoeff, *Accreditation*

Tiffany Zike, *Assistant Director of Public Health*

ENCOURAGED BEHAVIORS

- **Share airtime:** Everyone participates; no one person dominates.
- **Assume that together we know more:** Work to understand – and value – the assumptions, opinions, and ideas of others.
- **Reject the culture of blame:** Be tough on ideas, gentle on people.
- **Explore unconventional approaches:** New conditions demand new solutions.
- **Come prepared:** Do your pre-reading. Set aside time to really think before and after planning sessions.
- **Disagree and commit:** A lot of ideas will get surfaced during this process. Many will be good; not all can be executed. Challenge decisions if you disagree, but once a decision is made, fully commit to it.

A lot.

This is the core of our work and we love what we do. We will take great care with the trust you have placed in us.

Curiosity.

Our inquiry-based approach means we'll pose a lot of questions. We're deliberate about inviting in all voices and making different ideas visible.

Ability to pivot.

The process, at times, will be non-linear. Structure is important; rigidity is counter productive.

No surprises.

We want this to be fun, intellectually stimulating, and drama-free.

WHAT YOU CAN EXPECT FROM US

Strategic Planning Goal:

Create a 5-year strategic plan that will inspire, provide clarity for the future of the Needham Health Department, and meet the Public Health Accreditation Board (PHAB) requirements

Phase 1: Strategic Planning Preparation July, August 2023

Objectives:

- Review Needham mission/vision for updates and validation
- Review past strategic plans and conversations for inclusion
- Conduct key-informant interviews with key stakeholders and Board members

Deliverables:

- Shared mission & vision statement & guiding principles
- Three (3) facilitated sessions to discuss short- and long-term goals and objectives
- Key-informant interviews completed

Phase 2: Strategic Plan Design September - November 2023

Objectives:

- Develop strategic plan based on vision, goals, and objectives determined in Phase 1
- Construct 3-5-year strategic plan with timelines for key milestones and deliverable

Deliverables:

- Three (3) facilitated strategic planning sessions to flesh out the material and substance of the strategic plan
- A draft 5-year strategic plan for Needham
- A draft list of initial goals and 1-, 3-, and 5-year goals and objectives

Phase 3: Strategic Plan Finalization and Closeout December 2023

Objectives:

- Finalize strategic plan
- Support transition and adoption of strategic plan

Deliverables:

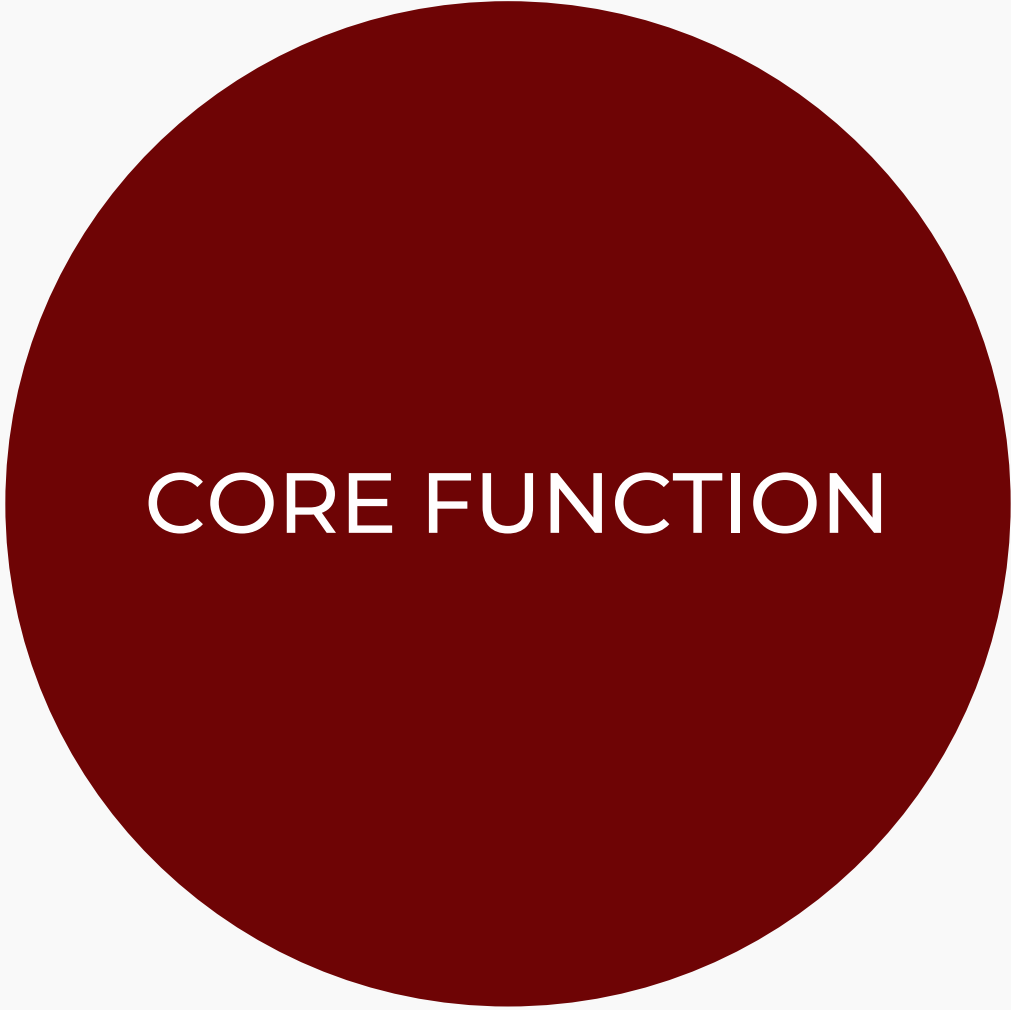
- A finalized and approved strategic plan with design aesthetic for external use
- A reviewed and updated 1-year work plan tied to the 5-year strategic goals and objectives

PUBLIC HEALTH ACCREDITATION BOARD (PHAB) FRAMEWORK

PHAB provides a nice framework that we can use to develop this strategic plan. They require the following:

1. **Developing the health department's mission, vision, and guiding principles or values.**
2. **Identifying strategic priorities**
3. **Developing objectives with measurable and time-framed targets**
4. **Identifying strategies or actions to address objectives**
5. **Describing how the strategic plan's implementation is monitored**
6. **Linkage with the community health improvement plan (CHIP)**
7. **Linkage with Performance Management (PM) system**

Strategic Planning Committee



CORE FUNCTION

Developed in 2021

MISSION STATEMENT

The Needham Board of Health, founded in 1877, and its Public Health Division strive to prevent and control the spread of disease, to address environmental issues, to promote healthy lifestyles, and to protect the public health and social well-being of all Needham's residents, especially the most vulnerable. This work addresses the social determinants of health, or the conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks, as defined in Healthy People 2020.

The Needham Board of Health, founded in 1877, and its Public Health Division strive to prevent and control the spread of disease, to address environmental issues, to promote healthy lifestyles, and to protect the public health and social well-being of all Needham's residents, especially the most vulnerable. This work addresses the social determinants of health, or the conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks, as defined in Healthy People 2020.

1. Does this language still feel relevant, especially after COVID-19?

2. Does it reflect where you want to go in 5 years?



DEVELOP A SHARED VISION

**Vision statements seek to inspire by centering
on long-term goals and demonstrating
ambition**

Examples:

- **MDPH: Optimal health and well-being for all people in Massachusetts, supported by a strong public health infrastructure and healthcare delivery**
- **CDC: Equitably protecting health, safety & security**

GUIDING PRINCIPLES

- Values and guiding principles drive the development of the vision statement
 - Help to answer the “why” for this group coming together
- What are some of your guiding principles and values? Why are *you* here?

MEETING CLOSE & NEXT STEPS

- Meeting cadence and schedule

Strategic Planning Committee:

- Who else should attend these meetings?
- Review Goals FY21/FY22 document

BME Strategies:

- Schedule meetings
- Present draft mission and vision statements

○ ○ ○ ○

THANK YOU!

QUESTIONS?

○ ○ ○ ○

Chris Korsmo, chris@copperstrategic.com

Sara Morris, sara@copperstrategic.com

Bryan Murphy-Eustis, beustis@bmestrategies.com

Meghan Russell, mrussell@bmestrategies.com

Karen Contador, kcontador@bmestrategies.com

NEEDHAM STRATEGIC PLANNING KICKOFF

Meeting Summary

June 27, 2023

Success in December looks like

- ☐ A 5 year- strategic plan that meets PHAB requirements but extends beyond
- ☐ Leveraging the process to create alignment w/BOH (including development of FY23/24 goals)
- ☐ Translating CHIP into measurable performance goals
- ☐ Connecting this process to:
 - Branding strategy work ([More Advertising](#))
 - Strategy for use of opioid settlement funds
 - Activities and engagement with SSA partners

Expectations/agreements (nuts and bolts of final product)

- ☐ Look beyond the core requirements to the bigger picture
- ☐ Treat the results of CHA as foundational (to be shared w/board in Sep; CHIP is next)
- ☐ Internal and external versions (can More Advertising do the design for external?)

Mission/Vision (these notes will be translated by BME/Copper into draft statements)

- ☐ 1st half has been the board's mission for decades (recent addition of "most vulnerable" and citizens changed to residents)
- ☐ Generally, does capture what we do
- ☐ A bit wordy; maybe break it in half (SDH language could be surfaced in GPs)
- ☐ Maybe we don't need the reference to 1877?
- ☐ [As a technical matter should refer to Health People 2030 vs 2020]

Guiding Principles/Our Why (these notes will be translated by BME/Copper into draft statement)

- ☐ Everyone has the right to live a healthy, safe lifestyle
- ☐ Promote health and safety
- ☐ Protect the most vulnerable
- ☐ Prevent vs. react
- ☐ Ensure people have a safe place to eat (+live/work/play)
- ☐ Contribute to individual and societal well being
- ☐ Ensure people have the opportunity to live to their fullest capacity, achieve potential
- ☐ Make government work better/more efficiently/be more responsive
- ☐ Even the playing field
- ☐ We touch the lives of so many
- ☐ Teach to fish (educate people so they can advocate for themselves, get screened)

WHAT'S COMING TO CLIENT NEXT FROM BME/COPPER

- ☐ Calendar invites for all meetings
- ☐ Updated workplan
- ☐ Draft mission/vision/guiding principles statements
- ☐ Draft key informant/stakeholder interview plan (Research Brief)
- ☐ Agendas and pre reads for July 25 meeting

Items needed from client (Karen/Bryan/Meghan to reach out)

- ☐ Introductions to More Advertising and opioid team
- ☐ CHA documentation currently available

Needham Strategic Planning Meeting Minutes

Date: June 27, 2023

Time: 2:00 pm - 3:30 pm EST

Location: Virtual Zoom link

<https://us06web.zoom.us/j/85466420004>

In attendance:

Diana Acosta, *Shared Services Manager*

Tara Gurge, *Assistant Director of Public Health*

Julie McCarthy, *Epidemiologist*

Tim McDonald, *Director of Health and Human Services*

Cindi Melanson, *Accreditation*

Lynn Schoeff, *Accreditation*

Tiffany Zike, *Assistant Director of Public Health*

Sara Morris, *Copper Strategic*

Chris Korsmo, *Copper Strategic*

Bryan Murphy-Eustis, *BME Strategies*

Meghan Russell, *BME Strategies*

Karen Contador, *BME Strategies*

I. Agenda Review

- A. BME doing project management
- B. Copper Strategic is co-facilitating and assisting with designing the overall process and creation of the strategic plan writing
- C. Ultimately it is your strategic plan and should reflect your words and your values

II. Objectives for the Day

- A. We want to come out of this meeting
 - 1. Introducing the strategic planning process for the next 6 months
 - 2. Affirming the structure (cadence of meetings, formulation of the strategic planning committee and their specific role)
 - 3. Reviewing the mission statement and discuss developing a vision statement
 - 4. Presenting next steps (meeting date).

Needham Strategic Planning

Meeting Minutes

III. Introductions

A. **Bryan:** BME, experience working in local public health for about 20 years.

Karen: BME, background in international, state, and municipal health policy.

Meghan: BME, background in local public health advocacy and strategic consulting, process improvement.

Sara: Co-founder of Copper Strategic, boutique strategy consultancy. Strategic planning and implementation support for nonprofits, government agencies, focus on public health, education, and youth development. Have worked with nonprofits in Washington State.

Chris: Co-founder of Copper Strategic. Experience in leading teams and organizations through planning, implementation, and creation of strategy. Implementation is a key piece, and want to make sure we look ahead.

Cindi: Needham, accreditation, a lot of groups need to talk to each other so it is great to work together.

Tara: Assistant Director of Environmental and Community Health. Work with Lynn and Cindi on accreditation.

Tiffany: Assistant Director of Nursing

Diana: Shared Services Program Manager - managing PHE (Dover Medfield and Sherborn) grant and contact tracing grant, regional training grant

Julie: Epidemiologist at Needham

Lynn: Accreditation and other projects

Needham Strategic Planning

Meeting Minutes

Tim: Director of Health and Human Services

IV. Encouraged Behaviors

A. **Share airtime:** Everyone participates; no one person dominates.

Assume that together we know more: Work to understand – and value – the assumptions, opinions, and ideas of others.

Reject the culture of blame: Be tough on ideas, gentle on people.

Explore unconventional approaches: New conditions demand new solutions.

Come prepared: Do your pre-reading. Set aside time to really think before and after planning sessions.

Disagree and commit: A lot of ideas will get surfaced during this process. Many will be good; not all can be executed. Challenge decisions if you disagree, but once a decision is made, fully commit to it.

Additional partners. If others are meant to make decisions, please have them attend these meetings.

B. **Any additions or questions?**

None presented.

C. **What you can expect from us**

Commitment to working with you, curiosity, ability to pivot, and no surprises.

V. Project Objective

A. **Bryan:** This is for us to affirm that we are all on the same page about the work we are going to be doing together. We want to make sure we are incorporating everything we need for PHAB. Start with taking a look back at your past plans, mission, vision, etc. Then we will look inward at

Needham Strategic Planning

Meeting Minutes

what we want as a group and finish with looking forward to future goals.

B. **Lynn:** We are currently contracting with another group working on doing a branding strategy for the department. These two things go hand-in-hand. Concerned about overlap, as it impacts some of the people you and they will be interviewing as key-informants. When I meet with them tomorrow. I will bring this up.

1. **Bryan:** We are aware that many initiatives are always happening at the same time and survey fatigue. We will piggyback off of what they are doing as much as we can. Maybe we can meet with them separately and see what our touchpoints and overlap are. Please let us know if there are any other parallel processes happening.

C. **Bryan:** Goal is a 5 year strategic plan that is clear, operational, complies with PHAB but also goes beyond. Internal and external versions that you can share with stakeholders and publish on your website. Is everyone aligned with this?

1. **Tiffany:** There was a portion of it to help our Board understand goal planning for a 2-3 year process. It doesn't really have to be part of the strategic plan but also more about how to do goal setting.

Bryan: When we get to the process when we start to outline the goals and objectives, would the Board be invited to those sessions? Or approached with a first draft?

Tiffany: Limited interaction - not full determining factor. We try to do BOH goals every 1 or 2 years, and it's more of a checkoff list

Needham Strategic Planning

Meeting Minutes

than something that we're striving for.

Tim: Engage them in a constructive way so we've framed a lot of the discussion for them. There is a slight difference between the BOH goals as elected officials from what the department's goals are. There is some misalignment.

Lynn: Would like a better understanding of the differences and why we are going to have two sets of goals. Perhaps as we move along, it would be good to have a better understanding of that.

D. **Bryan:** Is there a core set of goals and objectives shared and equally held? Or are there goals that elected staff have as political figures that are unrelated to the day-in-day-out practice of the health department, and whether or not their goals need to be in the departmental strategic plan?

Tim: Board of Health (BOH) has a goal to have a Public Health Director funded by the town. As the Director of Health and Human Services, I want to have more staff to help us do the work we need to do. From the last round the board wanted to continue the existing work in goals and we wanted to look forward to new goals.

Tiffany: Tried focusing on performance management goals, improving on these processes while we strive for XYZ.

Bryan: When was the last BOH goal setting?

Tim: Two years, goals for calendar FY21/FY22. Most recent developments have been put on pause.

E. **Bryan:** We could think about facilitating the FY23/FY24 goals as part of

Needham Strategic Planning

Meeting Minutes

this plan?

1. **Tiffany:** If you want to do it, that would work.

Tara: We are having trouble moving forward, so that would be great.

Lynn: Including them in this process as key-informants will help. And once they see a solid strategic plan coming from us it'll help them shape their goals.

Bryan: When there is an opportunity to build synergy we would love to do that, it might mean we have to adjust the work plan, and we can talk about how to get that done so we can enter those meetings prepared. Given the presumed 6-7 month timeline of this process, sound we do FY24/FY25 goals instead?

Group agreed.

- F. **Tim:** We are also doing a separate community engagement and strategic plan for opioid work and this has been a public process.
- G. **Diana:** In my experience with shared services, we had a working group and knew what was going on, but when we were presenting the MOU or shared inspectional services idea, we received pushback from BOH because they didn't know what was going on. If we have them filled in sooner they have more time to understand.
- H. **Bryan:** We will make sure they are aware of the whole process. Similar to this, an overview and their role and why we need their goals, objectives, and insights. There are probably some goals with the PHE group that informs what we are doing. Had a discussion with Tim that we need to think about and be aware of how this fits into the PHE group.

Needham Strategic Planning

Meeting Minutes

- I. **Cindi:** Creating a Community Health Assessment (CHA) and the plan is to share that with the Board in September (BOH might not have an August meeting). Next phase of the CHA would be to create a Community Health Improvement Plan (CHIP). With conducting key informant interviews and priorities, there could be some space for leveraging these tools with the CHIP.
 1. **Bryan:** We'll reach out to Julie to get any information that you have about CHAs, focus groups/interviews, so we can capture that information as part of this process. Performance management system - you can choose whatever tool or method you want to be able to monitor your performance. Cindi - we might take some time to make sure we outlined the right requirements for the PHAB.
- J. PHAB provides a nice framework that we can use to develop this strategic plan. They require the following:
 1. Developing the health department's mission, vision, and guiding principles or values.
 2. Strategic priorities.
 3. Objectives with measurable and time-framed targets.
 4. Strategies or actions to address objectives.
 5. A description of how the strategic plan's implementation is monitored, including progress towards achieving objectives, and strategies or actions.
 6. Linkage with the community health improvement plan (CHIP).
 7. Linkage with Performance Management (PM) system

Needham Strategic Planning

Meeting Minutes

VI. Strategic Planning Committee

- A. **Bryan:** Any questions or concerns about your role? Anyone else to include? Expect you to take ownership and be engaged so that we design something with your buy-in and thoughts.

Group had no questions

VII. Mission & Vision

- A. **Chris:** What is a mission statement, why do we have them? If you weren't part of the original process for the 2021 mission statement, they are traditionally action oriented and help external and internal people reinforce what they do, who they serve, how do we serve, and what are we in the business to do? There aren't rules for word count but we often find that shorter is better. These are general comments.

1. Does this language feel relevant? Especially after COVID?

- a) **Tiffany:** Needs to be updated to Healthy People 2030.

Tim: The first half of this was the Boards goal for decades, the most recent addition was in 2018 and added "especially the most vulnerable" and changed citizens to residents.

These were pre-2020. It is wordy. Would we want to strip out the bottom sentence? Does the first sentence cover it?

Chris: At the risk of wordsmithing by committee. That is a great question. Want this to be at the right altitude. Enough of what people need to know without being too detailed

Cindi: Founded in 1877, is that usually part of a mission statement?

Tim: I don't think it adds a ton.

Needham Strategic Planning

Meeting Minutes

Sara: Mission, vision, and guiding principles. Lots of room to include things that are most important to you.

Tara: Needham's mantra is Live Work Play. Maybe we can put this elsewhere.

Chris: Is this what we do, is this what we want people to know about what we are about and what we do?

Julie: We are doing what is in that last sentence but I do not know that we need to define what social determinants of health are in the mission statement.

Bryan: The second sentence does feel a reiteration of the first sentence, but expands to include the Live Work Play point.

Lynn: First time I'm seeing this mission statement. I'd like to look it over for a while and send feedback another time.

Tiffany: For the most part it captures what we do, and just about everything we do, unless we get into specifics of the program, especially the first sentence.

Diana: We can split it up. First part and second part.

Chris: Working with the first sentence to capture all of what's in the mission statement.

2. **Chris:** Would this still reflect in 5 years?

a) **Tiffany:** I think so.

B. Vision: Vision statements seek to inspire by centering on long-term goals and demonstrating ambition.

1. Examples are:

Needham Strategic Planning

Meeting Minutes

- a) Mass Dept. of Public Health: Optimal health and well-being for all people in Massachusetts, supported by a strong public health infrastructure and healthcare delivery.
 - b) CDC: Equitably protecting health, safety & security.
- C. **Chris:** Vision statements demonstrate ambition but are also built on your guiding principles
1. Guiding Principles: To develop the vision statement, start thinking about the “why” this group came together, what are the values that will drive the development of the vision statement?
 - a) **Lynn:** This is the difference where I struggle with, what is the BOH and the division. The division created a different mission statement in 2017. Should we have just one mission statement? The same is true for values and vision.
Tim: It hasn't been cleared before. We need to make a distinction between the professional staff and elected body.
Bryan: There are some day to day things that you each do differently. From a high level I think that the BOH and the division's mission and vision should be aligned. Let's design and update your mission and vision and make sure to bring them to the board to confirm alignment. Let me know if I am wrong, but I do not see the benefit to having separate mission and vision statements for each entity.
No comments from the group.
 - b) **Tara:** Helping people, promoting the health and safety of the public and doing this through food safety, septic,

Needham Strategic Planning

Meeting Minutes

regulations and housing code.

- c) **Bryan:** What is the future vision for Needham, where do you want to go/be?

Tara: No one would get sick from foodborne illness. Always striving to be better. At some point to be writing up less violations and spend less staff time in those establishments.

- d) **Chris:** Why do *you* do this work?

Tara: So people that are susceptible to illness can eat a healthy and safe meal at a food establishment without having a food allergy issue or get sick from food not being stored properly, or even die from foodborne illness.

Tiffany: I want to prevent instead of react. I don't want people to be reacting to situations that could have been prevented. I want to help people connect that and understand how to live healthier lives

Lynn: Contribute to individual and general wellbeing. I want people to live to their fullest capacity and public health is one of the ways we can do that.

Cindi: Echoing Lynn's comment. Being in public health generally draws us towards supporting people to achieve their maximum potential. Remove any barriers that could get in their way for health and safety, especially for those that are most vulnerable. Be a voice for them. People that do not have the knowledge for how these factors impact their health.

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Tim: Maybe from a broader perspective, I like when the government can be efficient in how it can help its residents. I want the government to be efficient, one of my passions is to make the most with what we have. The “why” for me is to make government work better for the residents it's supposed to serve.

Diana: From a shared services perspective, the “why” is to even that playing field for everyone. Make sure everyone has access to public health services. And also keeping health and racial equity, diversity in mind. Public health impacts so many people.

Bryan: You framed it as a right to equitable access to health, environment and community.

Julie: Echoing Diana. Coming from a lab environment, my “why” for entering public health is to teach people the power to advocate for themselves or care for themselves and make an impact. Teach people how to use these skills for the rest of their lives.

- e) **Bryan:** When I think about the vision for Needham, it's an environment where there is an absence of barriers that impact or influence the health of people from being able to live their best life.

VIII. Meeting Close & Next Steps

A. Feedback about these sessions

Bryan: Feel free to send us emails if you have any thoughts.

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B. Next meeting

1. July 11th and July 25th from 1:30 pm - 3:00 pm

C. Next Steps:

1. Strategic Planning Committee next steps:
 - a) Think about who else should attend these meetings
 - b) Review Goals FY21/FY22 document: What are the strategic priorities to be successful in achieving those goals?
 - c) Share any documents that you think are relevant to the Google Drive
2. BME Strategies next steps:
 - a) Review all departmental goals and objectives, and materials from the CHA
 - b) Schedule meetings
 - c) Revise the mission statement and share it out to the group