TOWN OF HARWICH

BOARD OF HEALTH
732 Main Street Harwich, MA 02645
508-430-7509 – Fax 508-430-7531
E-mail: health@town.harwich.ma.us

TOWN OF HARWICH BOARD OF HEALTH
TUESDAY, MARCH 17, 2020-6:30 P.M.
HARWICH TOWN HALL – SMALL HEARING ROOM
MEETING AGENDA

As required by law, the Town may audio or video record this meeting. Any person intending to either audio or video record this open session is required to inform the Chair

I CALL TO ORDER

II MINUTES OF PREVIOUS MEETING (Regular Meeting Minutes) - February 18, 2020
Minutes shall be reviewed; proposed changes shall be possible; and a vote to approve with any noted changes shall be taken.

III 6:30 PM - BOARD OF HEALTH WORK SESSION

A. Coronavirus update and response discussion-*Vote to accept/deny/take this under consideration*

B. Continued Review of Draft Town of Harwich Nutrient and Pesticide Control Bylaw/Education
Vote to accept/deny/take this under consideration

IV NO EARLIER THAN 7:00 PM -OLD/UNFINISHED BUSINESS

A. Continued Hearing-7-Eleven/Syed Naqvi- Appeal of an order and fine issued by the Health Department for violation of the Regulations of the Harwich Board of Health Restriction the Sale of Tobacco Products, Section D and 105 CMR 665.010: Minimum Standards for Retail Sale of Tobacco and Electronic Nicotine Delivery Systems (continued from February 18, 2020)-*Vote to accept/deny/take this under consideration*

V NEW BUSINESS

A. Hearing-The Deacon's Folly Realty Trust, 21 Deacons Folly Road, to consider a variance request to upgrade a Title 5 septic system prepared by Ryder & Wilcox, Inc. - *Vote to accept/deny/modify/take this under consideration*
Variances from 310 CMR 15.211: Minimum Setbacks
1. Per 310 CMR 15.211(1): To allow a proposed soil absorption system to be 5' from the north and west property lines where 10' is required. Variance request of 5'.
2. Per 310 CMR 15.211(1): To allow a proposed soil absorption system to be 10' from a full foundation where 20' is required. Variance request of 10'.

B. Hearing-Paterson, 15 Pine Wood Lane, to consider a variance request to upgrade a Title 5 septic system prepared by Ryder & Wilcox, Inc. - *Vote to accept/deny/modify/take this under consideration*
Variances from 310 CMR 15.211: Minimum Setbacks
1. Per 310 CMR 15.211(1): To allow a proposed soil absorption system to be 15' from the cellar wall where 20' is required. Variance request of 5'.

C. Environmental Impact Review-Eastward Companies 3, 7, 15 & 16 Bascom Hollow, Environmental Impact Report to demonstrate compliance with Harwich Board of Health Regulation 1.211, plans prepared by Clark Engineering LLC. - *Vote to accept/deny/modify/take this under consideration*

VI **REPORT OF THE HEALTH DIRECTOR (February 2020)**-*Vote to accept/deny/take this under consideration*

VII **CORRESPONDENCE**-*Vote to accept/deny/take this under consideration*

VIII **PERMITS**

ESTABLISHMENT	ADDRESS	TYPE	TYPE	TYPE
STABLE				
Erin McWilliams (2020 New)	**758 Depot Street**	**Res. Stable**		
TITLE 5 INSPECTOR				
Linda J. Cronin *				
SEPTIC INSTALLER				
Lower Cape Excavation (2020 New)				
LVA Construction *				
FOOD SERVICE				
7-Eleven (2020 New Ownership)	**5 Route 28**	**Less than 5000 sf**	**Milk & Cream**	**Take Out**
Cape Cod Lavendar Farm *		Event Permit		
Dancing Spoons A Go Go Food Truck (2020 New)		**Mobile**		
Foss Farms (2020 New)		**Event Permit**		
Harwich Junior Theatre *	265 Sisson Road	Limited Food Svc		
Harwich Junior Theatre *	105 Division Street	Limited Food Svc		
Harwich United Methodist Church *	1 Church Street	Institution		
Seawind Meadows, LLC *		Event Permit		
TOBACCO				
7-Eleven (2020 New Ownership)	**5 Route 28**			
MOTEL				
Handkerchief Shoals Inn (2020 New Ownership)	**888 Route 28**			
* 2020 Renewal				

Vote to accept/deny/take this under consideration

IX **OTHER**-*Vote to accept/deny/take this under consideration*

X **ADJOURN**-*Vote to accept/deny/take under consideration*

Authorized posting officer:

Jennifer Clarke
Signature

Date

Posted by:

Town Clerk

Date 3/11/2020

Per the Attorney General's Office: The committee may hold an open session for topics not reasonably anticipated by the Chair 48 hours in advance of the meeting following "New Business." If you are deaf or hard of hearing or a person with a disability who requires an accommodation, contact the Selectmen's Office at 508-430-7513

II.

TOWN OF HARWICH

BOARD OF HEALTH
732 Main Street Harwich, MA 02645
508-430-7509 – Fax 508-430-7531
E-mail: health@town.harwich.ma.us

TOWN OF HARWICH BOARD OF HEALTH
TUESDAY, FEBRUARY 18, 2020-6:30 P.M.
HARWICH TOWN HALL – SMALL HEARING ROOM
MINUTES

BOARD OF HEALTH MEMBERS PRESENT: Chairwoman Pamela Howell, R.N., Vice Chairwoman Sharon Pfleger, Members Matthew Cushing, M.D., Ronald Dowgiallo, D.M.D & Matthew Antoine

STAFF MEMBERS PRESENT: Senior Health Agent Kathleen Tenaglia & Executive Assistant Jennifer Clarke

OTHERS PRESENT: Parin Patel, David Stott, John Schnaible, Leo Cakounes, Rob Donovan, Maulik Patel, Laura Kelly, Mark Farber & others

Recording & Taping Notification: As required by law, the Town may audio or video record this meeting. Any person intending to either audio or video record this open session is required to inform the Chair.

I CALL TO ORDER

Chairwoman Howell called the meeting to order at 6:30 p.m.

II MINUTES OF PREVIOUS MEETING- January 21, 2020

Dr. Cushing moved to approve the minutes of the January 21, 2020 Board of Health meeting, 2nd by Mr. Dowgiallo and approved 4-0-1 (Pfleger).

III 6:30-7:00 PM- BOARD OF HEALTH WORK SESSION
A. Continued Review of Draft Town of Harwich Nutrient and Pesticide Control Bylaw/Education-Discussion with Shawn Fernandes from the Golf Department

Golf Superintendent Shawn Fernandez was present to discuss the history of fertilizer use at Cranberry Valley and how they have reduced their rates, thoughts on organic fertilizer and how they work, pesticide use and thoughts as it pertains to the town and the environment and the hope of Cranberry Valley to become an Audubon International cooperative sanctuary. Mr. Fernandez informed the Board that his main goal since starting his job in 1999 was to reduce fertilizer use. He uses approximately 11 ounces per 80 acres of land. The goal of Cranberry Valley is to give the best product that they can, but understand that we are dealing with financial and economic situations. In April and November, the golf course uses a synthetic fertilizer and in the middle of the summer, they are able to use organic products. Mr. Fernandez reviewed the soil testing and water testing that is done at the golf course, noting that they try to always do preventative maintenance.

In addition to Cranberry Valley, Mr. Fernandez also takes care of the front field at Monomoy and advises the Highway Department for the fields that they maintain, which is approximately 80-90% of town owned land.

At Cranberry Valley and other town owned properties, they try to move away from the use of glyphosate, but Mr. Fernandez stated that he does not want to lose the option to ask for permission to use it, if absolutely necessary.

Mr. Dowgiallo asked if there is any alternative that they can use on the golf course, other than "Round Up". Mr. Fernandez asked the Board to remember that "Round Up" is a chemical that is still legal to use in the state of Massachusetts. However, where we are a municipality, they do listen to Boards and others to try and look at different treatment methods.

Ms. Pfleger would still like to see education provided and feels that it would answer a lot of questions. Mr. Fernandez agreed and also offered any assistance to the Board. Ms. Pfleger stated that she does not think that there is any data that links glyphosate to cancer and Mr. Fernandez agreed and added that that the chemistry needs to be understood.

Mr. Dowgiallo wants to be sure that the town does not get involved in any kind of law suit as has been seen on the news.

Ms. Pfleger moved to continue this discussion until an upcoming Board of Health Work Session, 2nd by Mr. Dowgiallo and approved 5-0-0.

IV **OLD/UNFINISHED BUSINESS** ***(NO EARLIER THAN 7:00 P.M.)***

A. (Continued from November 12, 2019 Board of Health Meeting) Request for Extension of Board of Health Condition- Request from 21 Plus Smoke Shop, 1421 Orleans Road, to extend the deadline of their approved tobacco application until April 30, 2020

Chairwoman Howell opened the hearing. Parin Patel was present. Mr. Patel informed the Board that he is requesting an extension of their Board of Health condition because they are still in the process of trying to finalize their lease. The company that they are dealing with is a large company so it is taking longer to receive correspondence from them. They have a contractor lined up and are simply waiting on approval from the landlord.

No public comment was heard. Chairwoman Howell closed the hearing.

The Board stated no objection to Mr. Patel's request. Ms. Howell did suggest that it might be better to approve the request on a month by month basis. If they need another extension after one month, Mr. Patel can request, in writing, to be on another Board of Health agenda.

Health Agent Tenaglia stated that the Health Director recommended that they be in operation by March 17, 2020 and if he needs a further extension, he will have to submit a written request to the Board.

Dr. Cushing moved to approve the request to extend the deadline of the approved tobacco application from 21 Plus Smoke Shop, 1421 Orleans Road, until March 17, 2020 and that if the owner needs an additional extension, that they submit a written request to the Board of Health, 2nd by Ms. Pfleger and approved 5-0-0.

V **NEW BUSINESS**

A. Hearing-7 Eleven 34434/Syed Naqui-Appeal of an order and fine issued by the Health Department for violation of the Regulations of the Harwich Board of Health Restricting the Sale of Tobacco Products, Section D and 105 CMR 665.010: Minimum Standards for Retail Sale of Tobacco and Electronic Nicotine Delivery Systems

Chairwoman Howell opened the hearing. Syed Naqui was present. Mr. Naqui stated that he no longer has access to the video because he has turned the store back over to corporate. He went on to request that the Board of Health reduce the $1000.00 fine, claiming a financial hardship.

Dr. Cushing asked Mr. Naqui if he was in charge and responsible for his employees on the day of the violation. Mr. Naqui responded that he was.

Mr. Naqui stated that since the new tobacco regulations went into place, it has harmed his business. He added that he has been paying the salaries out of his pocket and he doesn't have any money left, which is why he returned the store back to the corporate office. Dr. Cushing asked if Mr. Naqui has any evidence that he cannot

afford to pay the fine. Mr. Naqui responded that if the Board gives him time, he can provide documentation. Dr. Cushing said that he would be willing to consider the appeal request with further evidence from Mr. Naqui.

Health Agent Tenaglia stated that Health Director Eldredge requested a copy of the surveillance tape or a written statement from Mr. Naqui or the clerk. As of today, neither of those have been received.

Dr. Cushing moved to continue the hearing for 7-Eleven 34434/Syed Naqui, until the March 17, 2020 Board of Health meeting and require that Mr. Naqui submit documentation showing his financial hardship and inability to pay the fine, plus that a letter from 7-Eleven Corporation be sent to the Health Department showing that they have retained control of the business, 2nd by Mr. Dowgiallo and approved 5-0-0.

B. Hearing-Lucey, 32 Dunes Road, to consider a variance request to relocate and replace an existing pump chamber & request for relief from providing a monopour or plastic construction pump chamber
Harwich Board of Health Regulation 1.210
1. Per Harwich Board of Health Regulation 1.210: To allow a proposed pump chamber to be 35' from the wetland as recognized by the Harwich Conservation Commission where 50' is required. Variance request of 15'.
2. Per Harwich Board of Health Regulation 1.210: To allow for relief from providing a monopour or plastic construction pump chamber within 100' of a wetland as recognized by the Conservation Commission

Chairwoman Howell opened the hearing. John Schnaible from Coastal Engineering Company was present. Health Agent Tenaglia read the variances being requested. The homeowners would like to install a new hardscape including stairs and stone walls that will be located over the existing pump chamber. To best access the pumps, the chamber is being moved. The chamber will be farther away from the resource area than it is now. Industry does not make a 2000 tank is that is H20 and the tank will be located under the driveway, so H20 is required. The engineer has proposed to wrap the tank and make it watertight in lieu of a monopour tank.

No public comment was heard. Chairwoman Howell closed the hearing.

Dr. Cushing asked for further explanation on the makeup of the pump chamber. Mr. Schnaible reviewed how the pump chamber system works and that in order to get the required 24 hour storage, you need a 2000 gallon pump chamber.

Ms. Pfleger confirmed that the pump chamber will be located under the driveway. She asked how the system would be accessed. Mr. Schnaible responded that there will be covers to grade that will allow for access.

Health Agent Tenaglia stated that Health Director Eldredge recommends approval of the variances with the following conditions:

1. The property shall be restricted to a maximum of 7 bedrooms.
2. No increase in square footage or habitable space without further review by the Board of Health.
3. The 2000 gallon pump chamber shall be water tested prior to use.
4. Variances and conditions to be recorded at the Barnstable County Land Court.

Ms. Pfleger moved to approve the recommendation of the Health Director, 2nd by Dr. Cushing and approved 5-0-0.

C. Hearing-Murray, 23 Harbor View Road, to reconsider Order of Conditions granted September 14, 1994-No increase in square footage to the dwelling. Projects consists of adding a 2nd floor to the existing dwelling. The 2nd floor will consist off a bedroom, bathroom and office/study

Chairwoman Howell opened the hearing. Attorney Bill Reilly was present. The approved floor plan in 1994 did not include any finished space in the basement. The proposed floor plan shows an increase in habitable space by adding a second floor. The first floor is being modified to remove a bedroom and install a larger bathroom/master suite. The second floor is proposed to have a bedroom and an office/study accessed by a 4' cased opening. This area is not located in a watershed and is in phase 8 of the CWMP.

No public comment was heard. Chairwoman Howell closed the hearing.

Health Agent Tenaglia stated that Health Director Eldredge recommends approval of the request with the following conditions:

1. The office/study shall have a half wall open to the stairwell in order to remove privacy and the use of the room as a bedroom.
2. The property shall be restricted to a maximum of 2 bedrooms.
3. No increase in square footage or habitable space without further review by the Board of Health.
4. Variances and conditions to be recorded at the Barnstable County Registry of Deeds.

Dr. Cushing moved to approve the recommendation of the Health Director, 2nd by Ms. Pfleger and approved 5-0-0.

D. Value Mart, 435 Route 28,-Food Service Permit suspension hearing for repeat violations of 105 CMR 590.000: The State Sanitary Code and the 2013 FDA Food Code

Chairwoman Howell opened the hearing. Attorney Matthew Porter was present with Bahecharbhai Patel. Attorney Porter stated that the violations are extremely unfortunate and unacceptable. The employee who was on staff when the violations occurred has been let go. According to Attorney Porter, the violations have been corrected. Mr. Patel stated that the property, including the outside, has been cleaned up. Health Agent Tenaglia read the history of violations at the property, dating back to October 2018. This suspension hearing is due to a culmination of many violations cited over the lasts two months. Expired food items are routinely brought to the attention of management, removed from the shelves and days later, more expired items are back on the shelves. It is believed that the owner is not getting the food from an approved source. In addition to the litter that has still not been completely cleaned up, the store now has evidence of a mice infestation. All affected food items and containers have been discarded and shelving disinfected, however the storage room remains an issue. Holes in the ceiling are most likely the access method for the rodents.

Ms. Pfleger asked how the holes in the ceiling would be addressed. Health Agent Tenaglia responded that the pest control company would more than likely be filling the holes as part of their contract. Ms. Pfleger would like to see a condition that that the holes be filled.

Mr. Dowgiallo asked who has been running the store for the last month. Mr. Patel responded that 2 employees were as he was out of the country. Ms. Pfleger added that the owner should have been following up with employees while he was away.

Dr. Cushing would like to be sure that all of the trash outside is removed. He would also like to see the egress and ingress patterns of the rodents sealed so that the issue cannot re-occur. Dr. Cushing suggested allowing a one month time period for removal of the trash, including anything located in the marsh. Ms. Pfleger disagreed and feels that 2 weeks is more appropriate for compliance.

Attorney Porter stated that the establishment receives their food products from J. Polep Distributer.

Mr. Antoine asked what would happen if follow up inspections continue to show violations. Health Agent Tenaglia responded that the Health Director's recommendation would be that their food service permit be suspended for 30 days.

Health Agent Tenaglia informed the Board that staff will be conducting weekly inspections to insure 100% compliance. Health Director Eldredge has recommended the following:

1. Owner must provide a signed contract with a pest control company by Friday, February 21, 2020 at 4:00 p.m.
2. Owner must provide invoices for food products to show where they are coming from.
3. Written plan of action required for monitoring use-by dates.

4. Weekly inspections with 100% compliance

The Board requested the following conditions be added:

5. All outside trash, including in the marsh area, will be cleaned up within 2 weeks of the meeting date.
6. Evidence that egress and ingress for all rodents has been eliminated within 2 weeks of the meeting date.
7. If owner is unable to attain the above, recommend suspension of food service permits for 30 days.

Dr. Cushing moved to accept the recommended conditions, 2nd by Ms. Pfleger and approved 5-0-0.

VI REPORT OF THE HEALTH DIRECTOR (January 2020)

Health Agent Tenaglia read the report of the Health Director for January 2020.

VII CORRESPONDENCE

No correspondence was discussed.

VIII PERMITS

ESTABLISHMENT	ADDRESS	TYPE	TYPE
FOOD SERVICE			
Cakes for All Occassions *	15 Partridge Lane	Limited Food Svc.	
Corner of Yum *	31 Sea Street	Caterer	
Jake Rooneys *	119 Brooks Road	>150 seats	
Kim Jerauld *	1281 Orleans Road	Limited Food Svc.	
Mooncussers Tavern *	86 Sisson Road	61-150 seats	
Nobska Farms *		Event Permit	
Pilgrim Congregational Church *	533 Route 28	Institution	
Pleasant Lake Farm *	2 Birch Drive	Retail <600 SF	
Reds Pizza *	703 Main Street	Retail <50 SF	31-60 seats
Ridiculous Fun *	24 Mabel Canto Way	Event Permit	Limited Food Svc.
The Family Pantry of Cape Cod *	133 Queen Anne Road	Mobile Food	
Wellfleet Chick Koop & Farm *		Event Permit	
Wequassett Resort-Outer Bar & Grill *	2173 Route 28	61-150 seats	
Wequassett Resort-Main Kitchen *	2173 Route 28	>150 seats	
Wequassett Resort-Pavilion *	2173 Route 28	61-150 seats	
Wequassett Resort-Tennis Grille *	2173 Route 28	1-30 seats	
SEPTIC HAULER			
United Site Services *			
STABLE			
Ronald Daigle & Kristen Goulis *	9 Sadie's Way	Res. Stable	
Solomon & Laurie Jean Ellis *	15 North Westgate Road	Res. Stable	
Susan Shaw *	326 Main Street	Res. Stable	
SEPTIC INSTALLER			
A & S Construction *			
Aaron T. Gingras *			
Cape Coastal Builders *			
J.C. Ellis Design Co. Inc. *			
MCE Dirtworks *			
Peter W. McIntire & Sons, LLC *			
TITLE 5 INSPECTORS			
Jason C. Ellis *			

Joseph M. Martins *			
Michael O'Loughlin *			
LICENSED UTILITY INSTALLER			
Bortolotti Construction (2020 New)			
John Martin, Inc. (2020 New)			
Northeast Construction (2020 New)			
Robert B. Our Co. Inc. (2020 New)			
T.W. Nickerson, Inc. (2020 New)			

* 2020 Renewal

Dr. Cushing moved to approve the permits as per list dated February 18, 2020, 2nd by Ms. Pfleger and approved 5-0-0.

IX OTHER

No other items were discussed.

X ADJOURN -The meeting adjourned at 8:04 p.m.

Ms. Pfleger moved to adjourn the meeting at 8:04 p.m., 2nd by Dr. Cushing and approved 5-0-0.

Respectfully Submitted,

Jennifer Clarke

Next meeting is Tuesday, March 17, 2020 at 6:30 p.m. in the Small Hearing Room.

Documents included in February 18, 2020 Board of Health Meeting Packet:

- February 18, 2020 Board of Health Agenda
- Draft Board of Health Minutes dated January 21, 2020
- Letter from Shawn Fernandez to Health Director dated February 12, 2020
- Copy from CWMP
- UMASS Extension Step by Step Fertilizer Guide for Home Grounds and Gardening
- Understanding a Turf Fertilizer Label dated May 2011
- Request from 21 Plus Smoke Shop/1421 Orleans Road dated February 3, 2020
- Letter to 21 Plus Smoke Shop dated November 18, 2019
- Board of Health Site Summary for 21 Plus Smoke Shop dated November 12, 2019
- Request from 21 Plus Smoke Shop/1421 Orleans Road dated September 30, 2019
- Request from 7-Eleven dated January 28, 2020
- Letter to 7-Eleven dated January 22, 2020
- Tobacco Compliance Check Form for 7-Eleven dated April 14, 2015
- Site Summary for 32 Dunes Road dated February 18, 2020
- Board of Health Variance Application and Associated Documents for 32 Dunes Road dated February 5, 2020
- Site Summary for 23 Harbor View Road dated February 18, 2020
- Board of Health Variance Application and Associated Documents for 23 Harbor View Road dated February 4, 2020
- Site Summary for Value Mart/435 Route 28 dated February 18, 2020
- Letter sent to Value Mart dated February 6, 2020
- Town Harwich Non-Criminal Violation Notice dated February 6, 2020
- Narrative for Value Mart dated February 5, 2020
- Various Photos for Value Mart dated February 5, 2020
- Letter sent to Value Mart dated January 17, 2020

- Various Photos for Value Mart dated January 14, 2020
- Health Director Monthly Report dated February 5, 2020
- Town of Harwich Report of the Health Director 2019
- Letter to Value Mart dated January 17, 2020
- Letter of Main Street Market dated January 22, 2020
- Letter to Portside Liquors dated January 22, 2020
- Letter to 7-Eleven dated January 22, 2020
- Any other documents submitted for/at the February 18, 2020 Board of Health Meeting

To the Harwich Board of Health
24 February 2020

Hello, I'm going to start this letter with some local past history:

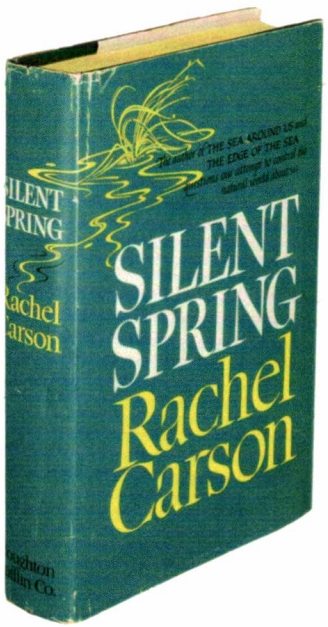
One of the late President John F. Kennedy's favorite books was Henry David Thoreau's *Cape Cod,* published in 1865. When in Washington, D.C., Kennedy, a yachtsman, always craved the Cape Cod winds and turbulent Atlantic waves. He restored his health sailing the Nantucket Sound waters around sandbars and shoals. The elemental forces of the sea helped Kennedy cope with the pain of Addison's disease and cleared his mind of the clutter of retail politics. Kennedy understood exactly what Thoreau meant when the naturalist wrote about the Cape that "a man can stand there and put all of America behind him."

On his bookshelf in Hyannis Port, alongside *Cape Cod,* sat two books by Rachel Carson: *The Sea Around Us* and *The Edge of the Sea.* When it came to conservation, only marine-related issues regularly caught Kennedy's attention. In awe of the millions of shore, sea, and marsh birds that used the Cape as a stopover during their seasonal migrations, Kennedy, a Massachusetts Audubon Society supporter, wanted to make sure that the shoreline remained unsullied by industrialization. In this spirit, on September 3, 1959, Kennedy, then a member of the U.S. Senate, cosponsored the Cape Cod National Seashore bill with his Republican colleague Leverett Saltonstall. As a longtime resident of Hyannis Port, Kennedy had no detailed knowledge of the lower Cape area, but he routinely flew over it in helicopters as the seashore legislation circulated through Congress.

Running for president in 1960, Kennedy advocated saving seashores as wildlife refuges and recreational areas. Supreme Court Justice William O. Douglas, a New Dealer and close Kennedy family friend, set the tone and tenor of JFK's burgeoning environmentalism when he intoned at a Wilderness Conference in San Francisco that the "preservation of values which technology will destroy . . . is indeed the new frontier."

> ***"Crushed eggs. Dead eagles. Birth defects. The 1960s and '70s were a trying time for the American environment, thanks to DDT. The effects of the toxic pesticide became obvious quickly despite agricultural companies' prolonged attempts to give it a clean bill of health."***

When Rachel Carson's *Silent Spring* was at last published in book form on September 27, 1962, the chemical industry went ballistic. With the release of Rachel Carson's 1962 *Silent Spring*—published in part as a series in *The New Yorker* magazine, the same year—news DDT's toxic effects spread. As public awareness peaked, the debate caught fire, causing President Kennedy to order a scientific inquiry.



Kennedy instantly became Public Enemy No. 1 for propping up *Silent Spring* as worthy of serious attention. The National Agricultural Chemicals Association rushed its propaganda booklet *"Fact and Fancy"* into print. The nub of the counterattack was that Mr. Fancy (a.k.a. Kennedy) was an East Coast elite who yachted frivolously around Cape Cod, his treasured national seashore, while allowing DDT manufacturers to be unjustly vilified. The association warned that factory shutdowns would mean thousands of lost jobs. When Kennedy awarded Dr. Frances Oldham Kelsey—a Food and Drug Administration scientist—a public service gold medal for discovering that thalidomide (a sedative frequently prescribed to pregnant women) caused deformities in babies, the pharmaceutical industry likewise felt blindsided. "It is all of a piece," Carson told *The New York Post*, "thalidomide and pesticides—they represent our willingness to rush ahead and use something new without knowing what the results are going to be."

In June 1962, National Audubon Society President Carl Buchheister had read a galley of *Silent Spring* just as *The New Yorker* installment was running and decided to back Carson. Lawyers from Velsicol lobbed veiled threats at John Vosburgh (*Audubon*'s editor) and Charles Callison (assistant to the NAS president) over lunch, warning them to beware of associating with Carson. Big Chemical was gearing up to blast her out of the water. Bravely, Vosburgh and Callison ignored the Velsicol bullying, though they were fearful of lawsuits. *Audubon* published an excerpt of *Silent Spring* and criticized, in an editorial, Velsicol's pesticide programs (though it didn't entirely endorse Carson's argument).

Furthermore, Audubon Society branches in different cities and states banded together to serve as refuges for Carson throughout the summer and fall of 1962. Fighting a kind of guerrilla war against Big Chemical, Carson spent time at the Audubon Camp in Maine and attended a book signing at the Audubon Society in Washington, D.C. Roland Clement, vice president of Audubon and a staff biologist, publicly embraced Carson's *Silent Spring* research; others at the nonprofit, more timid, expressed varied doubts. In September 1963, *Audubon* courageously reprinted a Carson lecture about New England wildflowers as *"Rachel Carson Answers Her Critics."* But National Audubon never supported a ban on DDT. Instead, the nonprofit simply gave Carson's defense real estate in its own organ of reform.

Not that Audubon was taking much of a risk. The Great Debate over *Silent Spring* ended in Carson's favor on May 15, 1963, when President Kennedy's 46-page President's Science Advisory Committee report—titled *"Use of Pesticides"*—was made public. Although the report wasn't definitive concerning any human health concerns about pesticides, it did contain a bombshell recommendation to increase public education about the biological hazards of pesticides. It was as if WARNING had been stamped on every page. "Until the publication of *Silent Spring* by Rachel Carson, people

were generally unaware of the toxicity of pesticides," the PSAC report stated. "The Government should present this information to the public in a way that will make it aware of the dangers while recognizing the value of pesticides."

Carson had three aims in writing: *Silent Spring*: creating an enduring work of literature on par with *The Sea Around Us*; alerting the public to the health dangers of pesticides; and forcing the U.S. government to regulate the chemical industry more stringently. That May she accomplished all three goals. The wheels of Congress now started turning in her direction. Senator Abraham Ribicoff of Connecticut demanded subcommittee hearings, which started the very day after the PSAC report came out. Secretary Udall heralded Carson as a "far-sighted and alert writer [who] has awakened the Nation."

This work by Carson, followed by the hard work and activities of the rise of the *Environmental Defense Fund* ("EDF"), a group of scientists formed explicitly to fight DDT. Which eventually lead to the banning of DDT by the federal government, and for that we can thank two primarily two persons Rachael Carson for her work in warning about the dangers of pesticides in the environment and a local politician who cared enough to learn, to act and to cause the regulation of pesticides to occur, Senator and later President John F, Kennedy from Cape Cod.

At a National Audubon Society dinner, in New York on December 3, 1963, with more than 500 dinner guests in attendance for the award ceremony, Rachel Carson was awarded their highest honor for conservation achievement.

"Conservation is a cause that has no end," she said in her acceptance speech. "There is no point at which we will say 'our work is finished.' "

"We stand now where two roads diverge. But unlike the roads in Robert Frost's familiar poem, they are not equally fair. The road we have long been traveling is deceptively easy, a smooth superhighway on which we progress with great speed, but at its end lies disaster. The other fork of the road — the one less traveled by — offers our last, our only chance to reach a destination that assures the preservation of the earth."
— Rachel Carson, "Silent Spring"

What is important about this bit of history? Is that today, **the threat and harm of DDT is gone only to be replaced by Glyphosate**.

The environment is once again under attack by an insidious pesticide in the form of Glyphosate and Glyphosate based herbicides ("GBH"). The main ingredient of Roundup™ is the isopropyl amine salt of glyphosate. Another ingredient of Roundup is the surfactant POEA (polyethoxylated tallow amine).

What has changed, **is that citizens can no longer count on Washington and EPA to protect us from the potential effects of GBH products**, for a number of reasons. Today the Rachael Carson's sounding the alarm are groups of citizens, scientists, public health officials around the United Sates and the World who are ringing the alarm about the potential and real harm of these products to humans, pets, pollinators and groundwater.

Further, as we have no local visionary political advocate like President Kennedy in the White House today to see the arm and cause action to happen. What we do have are local Boards of Health, Boards of Selectmen, Mayors and City Councils and Conservation members who are acting locally to eliminate the use of GBH's on municipal lands in the absence of sate of federal regulators.

With 1962 the publication of Rachel Carson's *Silent Spring*[1], a book that exposed the hazards of synthetic pesticides—environmentalists have been ringing alarm bells about these chemicals. Most of the attention has been focused on agricultural use and pesticides' impacts on farmworkers, their children, and the environment, as well as the potential for harm from pesticide residue found on produce[2]. Pushback against the chemicals has led to the banning of DDT[3], the formation of the EPA, and the passage of the Organic Foods Production Act[4] of 1990, among other things.

I will now provide information on the current state of GBH products. Simply put the principal manufacturer of a GBH product (Roundup™ and its variants) Bayer/Monsanto has for years claimed the product to be safe, and not a health hazard, the EPA has also maintained that position, although not universally accepted, and therefore the Pesticide Section of the Massachusetts Department of Agricultural ("MDAR") is accepting the EPA's continued registration and claims and allows GBH products to be sold and be readily available in the Commonwealth to both homeowners and commercial users. While the commercial use is far more regulated as to licensure, the use by the homeowner is not. Homeowner use far outstrips the commercial use. Often in Homeowner use, the mantra of, "If a little works, a lot must be better!" prevails.

The new pesticide ban movement comes at a critical time, say advocates, as the U.S. Environmental Protection Agency (EPA) under President Donald Trump is relaxing

---

[1] https://www.rachelcarson.org/SilentSpring.aspx
[2] https://www.ewg.org/foodnews/summary.php
[3] http://npic.orst.edu/factsheets/ddtgen.pdf
[4] https://www.nal.usda.gov/afsic/organic-productionorganic-food-information-access-tools

safeguards for several pesticides and herbicides[5]. Earlier this year, the agency announced it will re-evaluate[6] how it handles requests by states to impose stricter rules on pesticides, essentially limiting regulations. The EPA is also proposing restricting[7] how human studies (known as epidemiological studies) are used in official rule-making.

"We cannot trust what's going on at EPA; it's being dismantled," said Jay Feldman, executive director of Beyond Pesticides[8], a Washington, D.C.-based nonprofit. "Unless local communities take up the fight for the environment, we're not being protected."

And yet while about 40 million acres of managed turf[9] (i.e., residential and commercial lawns, golf courses, parks, etc.) is tended across the U.S. and about 88 million households[10] in the U.S. use pesticides, until recently there had been little interest in and virtually no research on herbicides sprayed in urban and suburban areas for cosmetic purposes, nor on the effects of such spraying on the health of ordinary Americans. (EPA study dated 2017)

In the 1990s, the New York attorney general's office released a report on the toxicity of golf course maintenance. Titled "Toxic Fairways,[11]" it showed that golf courses on Long Island use 4 to 7 times the average amount of pesticides used in agriculture, on a pound per acre basis. Then, in 1996, a study[12] revealed that golf course superintendents are subject to higher mortality rates from some cancers than other Americans. But none of that has appeared to move the needle on policy.

As a community that owns and operates a municipal golf course it is incumbent upon the Board to know exactly what chemicals are used to manage the course, the amounts, the toxicity of them and where they are used and who is using them.

Now, concerns about pesticide use appear to be taking center stage in mainstream consciousness with the current wave of lawsuits against Bayer[13] (Monsanto.) So far, every legal action brought forth against Bayer has prevailed with very large monetary judgments being awarded to the plaintiffs. Juries are not scientists; they are folks who can understand harm and testimony supporting the plaintiff's arguments. The interesting thing about liability lawsuits is that plaintiffs sue all parties, although for the

---

[5] https://civileats.com/2019/11/20/epa-weakens-safeguards-for-weed-killer-atrazine-linked-to-birth-defects/
[6] https://www.epa.gov/pesticide-registration/guidance-fifra-24c-registrations
[7] https://www.nytimes.com/2018/08/24/business/epa-pesticides-studies-epidemiology.html?searchResultPosition=3
[8] https://www.beyondpesticides.org
[9] https://www.isprs.org/proceedings/XXXVI/8-W27/milesi.pdf
[10] https://www.epa.gov/sites/production/files/2017-01/documents/pesticides-industry-sales-usage-2016_0.pdf
[11] https://www.beyondpesticides.org/assets/media/documents/documents/toxic-fairways-1995.pdf
[12] https://www.beyondpesticides.org/assets/media/documents/Proportionate%20mortality%20study%20of%20golf....pdf
[13] https://www.reuters.com/article/us-bayer-results/bayer-says-u-s-glyphosate-plaintiffs-more-than-double-since-july-idUSKBN1X90K1

most part the intimal wave of lawsuits targeted the parties with the deepest pockets, the manufacturers of the product.

In 2015, after the International Agency for Research on Cancer[14] (IARC) classified glyphosate as a probable human carcinogen[15] with a particular association to non-Hodgkin's lymphoma, thousands of cancer victims sued Bayer. More than 42,700 lawsuits have been filed as of October, Bayer said[16] this fall. In the first three trials in U.S. courts, all three of the juries have ruled against Bayer, awarding large damages to the plaintiffs. And the possibility of a settlement[17] is on the horizon. Some sources now indicate over 50,000 persons are ready to file either individually or as a class action.

"Continuing to lack a resolution in the massive nationwide Roundup cancer litigation, a leading U.S. plaintiffs' law firm is pressing ahead with preparations for a California trial involving a critically ill cancer patient and his wife who are suing the former Monsanto company claiming the man's disease is due to years of his use of Roundup herbicide. The Miller Firm, which has about 6,000 Roundup plaintiffs, is now preparing to go to trial against Monsanto's German owner Bayer AG on May 5 in Marin County Superior Court in California. The case has been granted preference status – meaning a quick trial date – because plaintiff Victor Berliant is critically ill. A deposition of Berliant is being scheduled for next week.[18]

Berliant, a man in his 70s, has been diagnosed[19] with Stage IV T-cell non-Hodgkin lymphoma and is planning to undergo a bone marrow transplant in March after multiple rounds of chemotherapy failed. His lawyers say it is necessary to take his deposition before the transplant as there is a risk, he may not survive the procedure or may be otherwise unable to participate at the May trial.

Berliant used Roundup from approximately 1989 to 2017, according to his lawsuit[20]. His wife, Linda Berliant, is also named as a plaintiff, asserting loss of consortium and other damages.
Other cases with trial dates are pending in the St. Louis, Missouri area and in Kansas City, Missouri, including one case with more than 80 plaintiffs scheduled for trial March 30 in St. Louis City Court."

Roundup has been around since the 1970s and is the most widely used herbicide in the world. And while the lawsuits also allege that the company was aware of the dangers

---

[14] https://www.iarc.fr/?s=Glyphosate
[15] https://www.iarc.fr/news-events/glyphosate-monograph-now-available/
[16] https://fortune.com/2019/10/30/roundup-lawsuits-bayer-defiant/
[17] https://www.reuters.com/article/us-bayer-glyphosate/bayer-reaches-agreement-to-postpone-more-glyphosate-lawsuits-for-settlement-talks-idUSKBN1YA1QO
[18] https://usrtk.org/monsanto-roundup-trial-tacker/as-settlement-talks-drag-on-another-monsanto-roundup-trial-nears/
[19] https://usrtk.org/wp-content/uploads/2020/02/Declaration-of-doctor-on-Berliant-case.pdf
[20] https://usrtk.org/wp-content/uploads/2020/02/Berliant-complaint.pdf

for years but did nothing to warn consumers, Bayer still maintains the chemical is safe[21].

"The overwhelming weight of science and regulatory reviews by leading health authorities around the world for more than 40 years have determined that glyphosate can be used safely and is not carcinogenic," Bayer spokeswoman Charla Lord told "Civil Eats" in a written statement. Pesticide regulating authorities in the U.S. agree. The EPA has maintained for years that glyphosate does not pose a risk to public health and isn't carcinogenic in humans; in April, the agency again reaffirmed its belief that the chemical is safe[22].

Independent scientists strongly disagree, however. After IARC's classification, an international group of scientists concurred in 2016[23] that glyphosate may cause cancer. The scientists said regulatory authorities rely on non-publicly available studies provided by industry researchers that have not been peer-reviewed. And earlier this year, a University of Washington analysis[24] found that exposure to glyphosate increases the risks of some cancers by more than 40 percent.

A recent study, September 2019, published by an international team of researchers found the chemical had the potential to induce breast cancer when combined with other risk factors. The study, "Glyphosate Primes Mammary Cells for Tumorigenesis by Reprogramming the Epigenome in a TET3-Dependent Manner"[25], led by scientists from Indiana's Purdue University and the Institut National de la Santé et de la Recherche Médicale (INSERM)/Institut de Cancérologie de L'Ouest (ICO) in Nantes, France, provides an important new lens through which to view pesticide-induced cancer development.

"This is a major result, and nobody has ever shown this before," says Sophie Lelièvre, PhD, a professor of cancer pharmacology in Purdue's College of Veterinary Medicine and co-leader of IBCN. "Showing that glyphosate can trigger tumor growth, when combined with another frequently observed risk, is an important missing link when it comes to determining what causes cancer."

While the EPA focuses on acute exposure—whether or not a person who is exposed once or twice will suffer or die—endocrinology research[26] has shown that pesticides accumulate over a lifetime through chronic low-dose exposure and are even passed on through generations. Children are especially at risk[27] because their small bodies are

---

[21] https://www.bayer.com/en/is-glyphosate-safe.aspx

[22] https://www.epa.gov/newsreleases/epa-takes-next-step-review-process-herbicide-glyphosate-reaffirms-no-risk-public-health

[23] https://jech.bmj.com/content/70/8/741

[24] https://www.sciencedirect.com/science/article/pii/S1383574218300887

[25] https://doi.org/10.3389/fgene.2019.00885

[26] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3138025/

[27] https://www.epa.gov/sites/production/files/2015-12/documents/pest-impact-hsstaff.pdf

more vulnerable to toxins. The chemicals have also been shown to harm the health of dogs[28] who are frequent visitors to parks and other green areas sprayed with herbicides.

In defiance of the EPA, California has listed glyphosate as a potentially cancer-causing substance under Proposition 65. And more recently, Vietnam[29] and Austria[30] have moved to ban glyphosate[31] (though Austria's ban may be hindered by a legal technicality[32]), Germany has said it will ban it by 2023[33], and France has banned[34] Roundup and most other glyphosate-based weed killers.

Across the Country, Banning Pesticides in Urban Areas

Environmentalists have leveraged the flood of lawsuits, new analysis, and media publicity to spur a new movement against the use of toxic chemicals in public and private spaces.

Lord, the Bayer spokeswoman, said such policies and bans are not science-driven. "Decisions to restrict glyphosate use have not been based on independent regulatory risk assessments nor the full body of scientific evidence on glyphosate's safety," she said.

> **"When the public protests. confronted with some obvious evidence of damaging results of pesticide applications, it is fed little tranquilizers pills of half-truth."**
>
> **— Rachel Carson "Silent Spring"**

Limiting exposure to pesticides in urban areas has faced a major obstacle, said Jay Feldman of *Beyond Pesticides*, in part because so much of it gets used on private lawns. And 43 states have laws that preempt[35] local governments' authority to restrict pesticide use on private property beyond existing state-level regulations.

The inability to control what residents spray on their lawns is an issue, Feldman said, because pesticide drifts through the air and travels through groundwater. It also explains why public places have moved to the center of the fight.

---

[28] https://www.ncbi.nlm.nih.gov/pubmed/22222006
[29] https://www.abc.net.au/news/rural/2019-04-12/vietnam-glyphosate-ban/10996480
[30] https://www.reuters.com/article/us-austria-glyphosate/austrian-parliament-backs-eus-first-total-ban-of-weedkiller-glyphosate-idUSKCN1TX1JR
[31] https://www.baumhedlundlaw.com/toxic-tort-law/monsanto-roundup-lawsuit/where-is-glyphosate-banned/
[32] https://www.washingtonpost.com/newssearch/?datefilter=All%20Since%202005&query=glyphosate&sort=Relevance
[33] https://www.theguardian.com/environment/2019/sep/04/germany-ban-glyphosate-weedkiller-by-2023
[34] https://www.reuters.com/article/us-france-glyphosate/france-to-ban-dozens-of-glyphosate-weedkillers-amid-health-risk-debate-idUSKBN1YD1BG
[35] https://www.beyondpesticides.org/assets/media/documents/lawn/activist/documents/StatePreemption.pdf

> **"It is not my contention that chemical insecticides must never be used. I do contend that we have put poisonous and biologically potent chemicals indiscriminately into the hands of persons largely or wholly ignorant of their potentials for harm. We have subjected enormous numbers of people to contact with these poisons, without their consent and often without their knowledge."**
> **— Rachel Carson, "Silent Spring"**

Beyond Pesticides and other groups (locally POCCA) has worked with[36] municipalities to pass pesticide restrictions mostly on public property, but Feldman said pushback from park officials and other administrators against organic lawn and weed management can be intense. "We were told it couldn't be done and it wasn't financially viable," he said. "The organic agriculture industry has proven that it can be done."

Currently millions of children play in parks and on fields in the U.S. and studies show two-thirds of those parks[37] are sprayed with synthetic chemicals. These can be inhaled, absorbed by children's skin, or tracked inside homes on feet, hands, or pets, he said.

A recent survey which showed that while 69 percent of American parents are looking to lessen exposure to pesticides in food, nearly the same number of parents (67 percent) do not consider sports fields, playgrounds, or parks to be of concern. Why is that, lack of knowledge plays an important role in those results.

I will admit that change can be difficult, and yes, the chemical companies are very good at telling us their products are great. But I have seen organic managed fields, and they look better than they ever have. And yes, there are some upfront costs to transition to organics, but over time there are savings due to using fewer chemical treatments (fertilizers) and less water. And, you can expect the savings will grow as the community restores soil biology in its parks and on soccer fields. As this process goes forward it is important that municipal staff are sharing results with curious homeowners.

Banning Glyphosate Is Not Enough

Easing off herbicides isn't always easy for public entities. The first challenge: changing the mindset of decision makers and park administrators who are used to synthetic chemicals. The biggest hurdle is trying something new. As a lot of the land managers have been maintaining parks in a certain way for a long time, and it's a complete shift in how we're asking them to manage the landscape.

---

[36] https://www.beyondpesticides.org/programs/lawns-and-landscapes/tools-for-change#locali
[37] https://www.ncbi.nlm.nih.gov/pubmed/22512421

Yet landscape managers often consent when they hear about the benefits reaped by other cities that have gone through the transition to organic management, she said. Weeds don't come back, turf conditions improve. As soil health increases, so does soil's water retaining ability—meaning that municipalities are able to save significantly on irrigation. And there's no chemical runoff from parks, so cities can better protect their waterways.

While the shift requires an initial investment, typically by year three when soil goes back to its natural state, cities usually start to save money.

Another challenge for the Board is convincing administrators not to replace glyphosate with another chemical that may be harmful to people's health, and to encourage proactive organic care. Non Toxic Neighborhoods offers communities an online organic toolkit[38], which includes a product list, examples of other cities' approaches to organic turf maintenance, and supporting research. The goal is to make sure landscape contractors and city staff have the tools to maintain the landscape aesthetics that everyone expects, and that organic maintenance is effective and not cost prohibitive.

Transitioning to organic lawn care isn't just about swapping synthetic herbicides for organic ones, rather, it's about regenerative land care—a system that relies on the same principles as regenerative agriculture[39].

A group Non Toxic Communities[40] is launching a nationwide training program, called the "Organic Land Care project," which will train landscapers and city employees to use organic lawn and weed management. It developed the training after large mainstream landscaping companies (which frequently contract with cities, schools, or homeowner associations) began approaching the group for help.
Many of these firms or departments are getting so much pressure and they don't know how to switch to organic methods, all they know is how to spray chemicals. Which is why protection is a many prong solution.

- First eliminating the use of GBH products and other pesticides only on municipal property, by regulation, by-law or policy. As the property owner or their agent, you can 100% control and manage how your property is maintained.

- Second transition to an organic natural method of turf care and management, eliminating the use of chemical fertilizers. This can be Town wide.

- Third educating the residents of the community that there is a better way.

---

[38] https://nontoxicneighborhoods.org/organic-toolkit
[39] https://civileats.com/?s=glyphosate&x=0&y=0
[40] http://www.nontoxiccommunities.com

Board of Health:

The general structure, powers, and duties of local boards of health are found at M.G.L. c. 111, s.26-33. Boards of Health, in Towns, may be appointed by the Selectmen or the Selectmen can act as a Board of Health. M.G.L. c. 41, s. 102B. Boards have authority to adopt and enforce reasonable health regulations under M.G.L. c.111, s.31. Case law upholds boards' authority to adopt regulations that are more restrictive than state standards so long as the local regulations do not conflict with state law, are not specifically preempted and have a rational basis for enactment.

Pesticides:

Even though the Massachusetts General Laws give no authority to local boards of health to regulate pesticides, the Massachusetts Supreme Court has decided that they may make reasonable regulations that are not inconsistent with the Massachusetts Pesticide Control Act, M.G.L. c. 132B or state regulations, 333 CMR 2.00. M.G.L. c. 132B, 333 CMR 2.00. *Wendell v. Attorney General, 394 Mass 518 (1985).* Additionally, boards of health receive notice of application of herbicide to a right of way 21 days prior to the application. 333 CMR 11.07.[41]

Boards also work to control mosquito-borne diseases, such as West Nile Virus and Eastern Equine Encephalitis, in collaboration with local mosquito control districts, when available, and in conjunction with the Department of Public Health and the Department of Agricultural Resources. In cases where an emergency exists, local boards of health may grant waivers for a use of pesticides not otherwise allowed. M.G.L. c. 132B, s. 6H.

The following is from the :[42]

"Massachusetts BOH Guidebook" September 2006
Section on: Hazardous Materials and Wastes Chapter 9, portion thereof:

"BOARD OF HEALTH ROLE AT A GLANCE

PART B: PESTICIDES
(Includes Herbicides, Fungicides and Rodenticides)

There is a great deal of concern over how pesticides affect both those who work with them occupationally and people residing in areas of use. While the hazards are not always precisely known, improper use of pesticides can be a significant public health problem.

[41] https://www.mahb.org/wp-content/uploads/2015/12/Duties-of-BOH.pdf
[42] https://www.mahb.org/wp-content/uploads/2016/01/gbook09.pdf

Some of the suspected effects of pesticides are birth defects, genetic mutations, and spontaneous abortions. Cancer has been found to be a long-term effect resulting from ingestion of products containing pesticide residues.

People most affected by pesticide use are those who work directly in agriculture and in manufacturing of pesticide products. Symptoms such as headache, stomach pain, dizziness, nausea, double vision and sterility have been reported.

There also may be pesticide concerns with housing developments in former farmlands (e.g., apple orchards). Specifically, soils in these areas can have very high levels of lead and arsenic. Because these situations are exempted by law from regulation under the state's 21E regulations and the Massachusetts Contingency Plan, it is often only the boards of health that may be able to raise, investigate, and ameliorate this concern.
Recommended Board of Health Activity
The following situations are examples of when a board of health may become involved with a pesticide issue:

a. A board of health, usually in conjunction with another local agency such as the housing authority, may be using pesticides itself, or contracting for someone else to apply the pesticides.

b. A board of health may receive complaints from townspeople about improper disposal of pesticides, the drifting of sprayed pesticides away from their intended area of use, or any suspected poisoning or damage done by pesticides.

c. Townspeople may call the board of health requesting information about proper pesticide use, or licensing and certification requirements.

In each of these situations, boards of health should be familiar with applicable state and federal laws and regulations, including licensing and certification requirements for dealers and users of pesticides. Within certain limits, a board may also adopt local regulations relevant to the use of pesticides within the municipality. *Town of Wendell v. Attorney General, 394 Mass. 518, 529-30 (1985)*, the Supreme Judicial Court found, "A local board of health has authority to make reasonable health regulations. G.L. c. 111, '31. Such regulations, however, must be consistent with State law." In other words, local boards of health may adopt regulations related to pesticide use, but they may not adopt regulations that are more stringent than state law. For example, if contamination of public or private water supplies is considered a potential problem, due to drift or runoff, the board may find it useful to prepare a map of private wells and other water supplies, and to prepare local regulations providing for board monitoring of pesticide use at water supply locations. Similarly, the board could require that it be notified before pesticides are applied, even though it may not ban the application of pesticides that are permitted under state law.

Other board of health activities could include:

1. Educate pesticide users and provide a program of alternatives to pesticide use;

2. Review and comment on state agency and utility company applications of pesticides to highways, utility easements, and near watersheds;

3. Review pesticides used in aquifer districts. Pursuant to M.G.L. c. 132B and 333 CMR 12.00 *et seq.*, the Massachusetts Department of Food and Agriculture annually issues a ground water protection list@ of pesticides that may not be applied within a primary drinking water recharge area;

4. Utilize local Special Permit plan review to govern the storage and use of pesticides; and
5. Become familiar with M.G.L. c. 132B, which requires licensing of pesticide applicators.

State Responsibilities (DFA)

Pursuant to the Massachusetts *Pesticide Control Act*, M.G.L. c. 32B, the Massachusetts Department of Food and Agriculture (DFA) now (MDAR) regulates all aspects of pesticide use, including:

a. registering pesticide products

b. investigating misuse, complaints, accidents, and field problems

c. licensing and certifying those who use or sell pesticides.

There are three distinct groups within the Department of Food and Agriculture (MDAR) involved in pesticide control:

a. The Pesticide Board is a committee of 13 people who set policy on pesticide use. This group has the power to adopt pesticide regulations. The board is chaired by the commissioner of the Department of Food and Agriculture and consists of six governmental members and seven private citizens.

b. The Sub-Committee on Registration, a subcommittee of the full Pesticide Board consisting of five members, has control over the registration of pesticide products. The subcommittee is chaired by the director of the Division of Food and Drugs of DPH.

c. MDAR staff carry out the actual work of testing, record keeping, and field investigation.
These are four types of credentials in Massachusetts:

Applicator licenses (for small commercial applicators who do not use restricted pesticides, or for employees in larger businesses who may use restricted pesticides when directly supervised by a certified person).

Private certification cards (for anyone such as farmers, nurserymen, and greenhouse operators who produce any plant or animal product for sale and who use restricted pesticides).

Commercial certification cards (for anyone who uses or supervises the use of a restricted pesticide and who does not qualify for private applicator certification).
State Responsibilities (U. Mass. Extension Service)
The Extension Service of the University of Massachusetts in Amherst can be an important source of information to any board of health faced with a pesticide issue.

The Extension Service:

a. supports a specialist in the Department of Entomology who assists groups having problems concerning pest control

b. acts as a source of technical information about pesticides

c. advises on individual cases

d. publishes a newsletter Pesticide News, eight times a year

e. provides, upon request, fliers dealing with a variety of pesticide issues."

"....The chemists' ingenuity in devising insecticides has long ago outrun biological knowledge of the way these poisons affect the living organism."
— Rachel Carson, "Silent Spring"

The current suite of pesticides, herbicides and other chemicals that are finding their way into our every day lives, is harming people, pets and pollinators, and as a Board of Health you have a statutory responsibility to mange this risk, in same manner as you manage smoking, septic waste and food safety. With due diligence, care and being precautionary rather than reactionary.

I would be more than pleased to appear before your Board in the future, to have an insightful discussion and review of this material with you. However, due to prearranged travel, I will not be available to meet with your Board at your meeting of 17 March 2020.

Sincerely,

C. Whiting Rice
Principal
The Whiting Group
A Land Use Consultancy
Unit 229, 8 Independence Way,
Franklin, MA 02038,
508-272-7441
cwrice@me.com

GLYPHOSATE - Understanding and Managing it in Massachusetts

Dr. Stephen C. Frantz, Research Pathobiologist
Global Environmental Options
South Hadley, MA

There is a multitude of documents and studies to justify total elimination of glyphosate-based herbicides (GBHs) in Massachusetts and elsewhere. However, there is resistance to such a ban and prominent among them (as given by some government agencies, towns, golf course personnel and pesticide technicians) are:

a. Classification of glyphosate as a human carcinogen (Group C, 2A) by WHO's International Agency for Research on Cancer is questioned.
b. It binds to soil, rapidly degrades and is not transported elsewhere.
c. There has not been significant research to justify reevaluation of its effects on public and environmental health.
d. Since the EPA registers it and FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) regulates it, it is legal to use and safe for applicators, consumers, and the environment.

Thus, let's look at significant facts provided by historical review, independent science and courtroom discovery:

In **1985**, toxicology staff of the US EPA Office of Pesticides and Toxic Substances concluded that glyphosate was a Class C oncogen; and clearly refuted challenges to the contrary from Monsanto (1).

After 1985, the EPA, at least at the administrative level, began to display behavior that was ill-suited to a government agency charged with protecting human and environmental health. Such behavior was challenged by some of its scientific staff in **2013** (2), but corruption and collusion persisted and intensified after WHO's International Agency for Research on Cancer concluded in **March 2015** that glyphosate is a human carcinogen (3,4). IARC noted that glyphosate also caused DNA and chromosomal damage in human cells. IARC's scientific rigor has been challenged, largely influenced by Monsanto, and such challenges have been successfully refuted by independent science (5,7).

March 15, 2017, U.S. Congressman Ted Lieu recommended that consumers stop using glyphosate because of the risks of non-Hodgkin's lymphoma (6). And, importantly, he called for an investigation by the Department of Justice to look into any potential misconduct by employees of the EPA.

Mostly post-2017 there have been many scientific studies related to morbidity and mortality in humans and other animals and to environmental degradation. Examples (details on p. 3) include: the link between glyphosate and non-Hodgkin's lymphoma (8); other disease relationships and finding glyphosate in childhood vaccines (9,10); pregnancy complications (11); breast cancer (12); inheritance of disease across generations and sperm mutations (13); increased development rate of antibiotic resistance (14); dire effects on honey bee gut microbiome and on sensory and cognitive abilities, and complications associated with GMO crops (15,16); negative effects below ground on microbes, earthworms and mycorrhizal fungi and interference with nutrient cycling (17,18); forestry spray drift with persistent contamination of edible plants (19); waterbody pollution from treatment of invasive species (20); glyphosate and breakdown products widespread transport off-site from agricultural and urban sources (21); atmospheric pollution and rainfall's contribution to the surface levels of glyphosate pollution (22); persistence in soil and leaching of glyphosate breakdown products through soil and transfer to waterways (23); glyphosate-derived phosphorous influences the cycling of phosphorus in soil, persists in the environment, and can influence soil phosphorus accumulation and losses to surrounding freshwater systems prone to nutrient pollution (24); research from the European Commission's Joint Research Centre and two Dutch laboratories shows glyphosate persists in soils affecting not only soil fertility and crop quality, but also human and environmental health. The concentrations of glyphosate and AMPA found in the

study have been shown to be toxic to soil organisms such as earthworms, beneficial bacteria and fungi, as glyphosate weakens down plants' natural defences making them susceptible to pathogens. These substances that get adsorbed by soil particles are not immobile, but can propagate through wind or rainfall, leading to air pollution and exposure through the atmosphere as well as contamination of surface and ground waters (25); GBHs have the potential to undermine crop health via: (i) impairment of the innate physiological defences by interruption of the shikimic acid pathway; (ii) impairment of physiological disease defences; (iii) interference with rhizosphere microbial ecology (in particular, GBHs have the potential to enhance the population and/or virulence of some phytopathogenic microbial species in the crop rhizosphere); and finally, (iv) the reduction in the uptake and utilisation of nutrient metals by crops (26).

Since March 2017, the Monsanto Papers have provided a treasure trove of internal documents slowly released as part of a US lawsuit by cancer victims against Monsanto over glyphosate (https://www.baumhedlundlaw.com/toxic-tort-law/monsanto-roundup-lawsuit/monsanto-secret-documents/). These documents show the company's real, and rather troubling, approach to science and evidence; and its unsavory alliances with government, universities, scientific journals, etc. to cover-up the harmful nature of glyphosate.

Conclusions:

a. Glyphosate is a carcinogen for humans and other mammals.
b. Glyphosate can be very persistent in soil and water, and moves both vertically and horizontally above and below ground including in groundwater, surface runoff and rainfall.
c. Abundant research shows a wide variety of morbidity and mortality in humans and other species, and ecosystem damage, attributable to glyphosate exposure.
d. The EPA cannot be considered a reliable source for information regarding this herbicide's impact on human and environmental health, and it's recent re-evaluation and registration approval of glyphosate-based herbicides should be considered invalid and subject to independent review. To justify glyphosate use on the basis of its "legal registration" by the EPA is specious at best; and following FIFRA regulations for glyphosate is scientifically irrelevant since it is based on incomplete or distorted science that fails to safely protect applicators, consumers, and the environment.

Recommendations:

Upon evaluating the information provided, it is scientifically and ethically illogical for MassDEP, MDAR and the Mass Pesticide Board to follow guidance of the EPA with regard to glyphosate. Further, MassDEP (https://www.mass.gov/files/documents/2019/09/30/mwcvrltr.pdf) appears to rely on MDAR for glyphosate guidance (https://www.mass.gov/files/documents/2016/08/xh/glyphosate-2011.pdf), and MDAR depends on USDA Forest Service for comprehensive glyphosate reviews and data (http://www.fs.fed.us/foresthealth/pesticide/risk.shtml). Unfortunately, the latter agencies are not scientifically current; that is, MDAR's data is basically pre-1989, and USDA mostly predates 2010. Glyphosate's effects on all life forms needs to be reevaluated with regard to available independent science, a sampling of which is provided herein. Note also that carbon storage/cycling (and soil fertility) depend on healthy plants and a healthy soil rhizosphere. Glyphosate interferes with RuBisCO's enzymatic function critical for plants' fixation of atmospheric CO_2 during photosynthesis; and it alters the rhizosphere microbial composition and disrupts microbial metabolism and nutrient cycling — resulting in reduced carbon sequestration. Overall, this can be called "The Glyphosate Complication" — as in an unfavorable evolution of a disease, health condition or medical treatment. I think "unfavorable" might be the kindest of adjectives that could be applied to the evolution of glyphosate, its series of patents, and its application history. It is obvious that the manner in which glyphosate policies and procedures are managed in the Commonwealth of Massachusetts are in critical need of revision. This document gives unambiguous reasons for such revision and for a Statewide ban on glyphosate that would maximize protection of public and environmental health, protect the food supply and water resources, and enhance carbon sequestration.

SUPPORTING DOCUMENTATION

— CARCINOGEN —

1)••March 4, 1985. **EPA Consensus review of glyphosate** signed by eight Toxicology Branch personnel and addressed to Robert Taylor, Product Manager, Herbicide-Fungicide Branch, US EPA Office of Pesticides and Toxic Substances. (https://archive.epa.gov/pesticides/chemicalsearch/chemical/foia/web/pdf/103601/103601-171.pdf)

Part E. Classification of Glyphosate

"In accordance with EPA proposed guidelines (FR of Nov. 23, 1984) the panel has classified Glyphosate as a Category C oncogen."

---

2)••March 4, 2013 — Court Document - 2017. **March 4, 2013 Letter from Marion Copley to Jess Rowland.** *Monsanto Papers*: Case 3:16-md-02741-VC Document 141-1 Filed 02/10/17 Page 1 of 1.

Note: Marion Copley, EPA Senior Scientist re. glyphosate (retired and dying of breast cancer), writing to her former supervisor, Jess Rowland, EPA Administrator in charge of glyphosate.

Jess,

Since I left the Agency with cancer, I have studied the tumor process extensively and I have some mechanism comments which may be very valuable to CARC based on my decades of pathology experience. I'll pick one chemical to demonstrate my points.
Glyphosate was originally designed as a chelating agent and I strongly believe that is the identical process involved in its tumor formation, which is highly supported by the literature.

-Chelators inhibit apoptosis, the process by which our bodies kill tumor cells
-Chelators are endocrine disruptors, involved in tumorigenesis
-Glyphosate induces lymphocyte proliferation
-Glyphosate induces free radical formation
-Chelators inhibit free radical scavenging enzymes requiring Zn, Mn or Cu for activity (i.e. SODs)
-Chelators bind zinc, necessary for immune system function
-Glyphosate is genotoxic, a key cancer mechanism
-Chelators inhibit DNA repair enzymes requiring metal cofactors
-Chelators bind Ca, Zn, Mg, etc to make foods deficient for these essential nutrients
-Chelators bind calcium necessary for calcineurin-mediated immune response
-Chelators often damage the kidneys or pancreas, as glyphosate does, a mechanism to tumor formation
-Kidney/pancreas damage can lead to clinical chemistry changes to favor tumor growth
-Glyphosate kills bacteria in the gut and the gastrointestinal system is 80% of the immune system
-Chelators suppress the immune system making the body susceptible to tumors

Previously, CARC concluded that glyphosate was a " possible human carcinogen". The kidney pathology in the animal studies would lead to tumors with other mechanisms listed above. Any one of these mechanisms alone listed can cause tumors, but glyphosate causes all of them simultaneously. It is essentially certain that glyphosate causes cancer. With all of the evidence listed above, the CARC category should be changed to "probable human carcinogen". Blood cells are most exposed to chelators, if any study shows proliferation of lymphocytes, then that is confirmatory that glyphosate is a carcinogen.

Jess, you and I have argued many times on CARC. You often argued about topics outside of your knowledge, which is unethical. Your trivial MS degree from l971 Nebraska is far outdated, thus CARC science is 10 years behind the literature in mechanisms. For once in your life, listen to me and don't play your political conniving games with the science to favor the registrants. For once do the right thing and don't make decisions based on how it affects your bonus. You and Anna Lowit intimidated staff on CARC and changed HIARC and HASPOC final reports to favor industry. Chelators clearly disrupt calcium signaling, a key signaling pathway in all cells and mediates tumor progression. Greg Ackerman is supposed to be our expert on mechanisms, but he never mentioned any of these concepts at CARC and when I tried to discuss it with him he put me off. Is Greg playing your political games as well, incompetent or does he have some conflict of interest of some kind? Your Nebraska colleague took industry funding, he clearly has a conflict of interest. Just promise me not to ever let Anna on the CARC committee, her decisions don't make rational sense. If anyone in OPP is taking bribes, it is her.

I have cancer and I don't want these serious issues in HED to go unaddressed before I go to my grave. I have done my duty.
Marion Copley
March 4, 2013

---

3)••IARC. 2015. **Some organophosphate insecticides and herbicides/ IARC Working Group on the Evaluation of Carcinogenic Risks to Humans.** *IARC monographs on the evaluation of carcinogenic risks to humans*: V.112. Lyon, France - 2017.
https://monographs.iarc.fr/wp-content/uploads/2018/07/mono112.pdf
Lyon, France, 20 March 2015 – The International Agency for Research on Cancer (IARC), the specialized cancer agency of the World Health Organization, has assessed the carcinogenicity of five organophosphate pesticides. The herbicide glyphosate and the insecticides malathion and diazinon were classified as probably carcinogenic to humans (Group 2A).
For the herbicide glyphosate, there was limited evidence of carcinogenicity in humans for non-Hodgkin lymphoma. The evidence in humans is from studies of exposures, mostly agricultural, in the USA, Canada, and Sweden published since 2001. In addition, there is convincing evidence that glyphosate also can cause cancer in laboratory animals. On the basis of tumours in mice, the United States Environmental Protection Agency (US EPA) originally classified glyphosate as possibly carcinogenic to humans (Group C) in 1985. After a re-evaluation of that mouse study, the US EPA changed its classification to evidence of non-carcinogenicity in humans (Group E) in 1991. The US EPA Scientific Advisory Panel noted that the re-evaluated glyphosate results were still significant using two statistical tests recommended in the IARC Preamble. The IARC Working Group that conducted the evaluation considered the significant findings from the US EPA report and several more recent positive results in concluding that there is sufficient evidence of carcinogenicity in experimental animals. Glyphosate also caused DNA and chromosomal damage in human cells, although it gave negative results in tests using bacteria. One study in community residents reported increases in blood markers of chromosomal damage.

What does Group 2A mean?
Group 2A means that the agent is probably carcinogenic to humans. This category is used when there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals. Limited evidence means that a positive association has been observed between exposure to the agent and cancer but that other explanations for the observations (called chance, bias, or confounding) could not be ruled out. This category is also used when there is limited evidence of carcinogenicity in humans and strong data on how the agent causes cancer.(micronuclei) after glyphosate formulations were sprayed nearby.

4)••April 28, 2015 — Court Document - 2017. **April 28. 2015 Email from Daniel Jenkins (U.S. Agency Lead, Regulatory Affairs, Monsanto, AG/1920) to William Heydens (Monsanto, AG/1000) re. Glyphosate IARC Question.** *Monsanto Papers*: Case 3:16-md-02741-VC Document 189-4 Filed 03/14/17 Page 1 of 4
Referring to the same EPA's Jess Rowland as in the March 4, 2013 document cited earlier, Daniel Jenkins notes that Jess Rowland requested a contact at ASTDR (US DHHS, Agency for Toxic Substances and Disease Registry because it was considering a review of glyphosate), and is quoted as saying **"If I can kill this I should get a medal"**. Jenkins goes on to caution Heydens: "However, don't get your hopes up, I doubt EPA and jess can kill this; but it's good to know they are going to actually make the effort now to coordinate due to our pressing and their shared concern that ASTDR is consistent in its conclusions with EPA."
NOTE: Monsantos 2015 efforts did succeed in delaying the ASTDR report, Toxicological Profile for Glyphosate, that was published in **April 2019**. This report supports and strengthens the 2015 cancer assessment of the International Agency for Research on Cancer (IARC noted above),

---

5)••Portier CJ, BK Armstrong, BC Baguley, et al. 2016. **Differences in the carcinogenic evaluation of glyphosate between the International Agency for Research on Cancer (IARC) and the European Food Safety Authority (EFSA).** *J Epidem Commun Health:* 70 (8). https://jech.bmj.com/content/70/8/741.full
The International Agency for Research on Cancer (IARC) Monographs Programme identifies chemicals, drugs, mixtures, occupational exposures, lifestyles and personal habits, and physical and biological agents that cause cancer in humans and has evaluated about 1000 agents since 1971. For Monograph 112, 17 expert scientists evaluated the carcinogenic hazard for four insecticides and the herbicide glyphosate. The WG concluded that the data for glyphosate meet the criteria for classification as a probable human carcinogen. The European Food Safety Authority (EFSA) is the primary agency of the European Union for risk assessments regarding food safety. In October 2015, EFSA reported on their evaluation of the Renewal Assessment Report (RAR) for glyphosate that was prepared by the Rapporteur Member State, the German Federal Institute for Risk Assessment (BfR). EFSA concluded that 'glyphosate is unlikely to pose a carcinogenic hazard to humans and the evidence does not support classification with regard to its carcinogenic potential'. Serious flaws in the scientific evaluation in the RAR incorrectly characterize the potential for a carcinogenic hazard from exposure to glyphosate. Since the RAR is the basis for the European Food Safety Agency (EFSA) conclusion, it is critical that these shortcomings are corrected.

---

6)••Lieu, TW. 2017. **Rep. Lieu Statement on new glyphosate safety concerns. March 15, 2017**/ Press Release
"...consumers should immediately stop using *Roundup*, whose core ingredient glyphosate has been labeled a likely carcinogen and has been linked to non-Hodgkin's lymphoma by the International Agency for Research on Cancer" He further stated, "We need to find out if Monsanto or the Environmental Protection Agency mislead the public. Reports suggest that a senior official at the EPA [undoubtedly re. Jess Rowland - see Apr. 28, 2015 above] worked to suppress a U.S. Department of Health and Human Services review of glyphosate [undoubtedly re. ASTDR -see Apr. 28, 2015 above], and may have leaked information to Monsanto." He also said, "I believe a Department of Justice Investigation is warranted to look into any potential misconduct by employees of the EPA. I also believe a congressional hearing in immediately warranted."

---

7)••Benbrook CM. 2019. **How did the US EPA and IARC reach diametrically opposed conclusions on the genotoxicity of glyphosate-based herbicides?** *Environ Sci Eur* (2019) 31: 2. https://doi.org/10.1186/s12302-018-0184-7
EPA and IARC reached diametrically opposed conclusions on glyphosate genotoxicity for three primary reasons: (1) in the core tables compiled by EPA and IARC, the EPA relied mostly on registrant-commissioned, unpublished regulatory studies, 99% of which were negative, while IARC relied mostly on peer-reviewed studies of which 70% were positive (83 of 118); (2) EPA's evaluation was largely based on data from studies on technical glyphosate, whereas IARC's review placed heavy weight on the results of formulated GBH and AMPA assays; (3) EPA's evaluation was focused on typical, general population dietary exposures assuming legal, food-crop uses, and did not take into account, nor address generally higher occupational exposures and risks. IARC's assessment encompassed data from typical dietary, occupational, and elevated exposure scenarios. More research is needed on real-world exposures to the chemicals within formulated GBHs and the biological fate and consequences of such exposures.

---

8)••L Zhang, I Rana, E Taioli, RM Shaffer & L Sheppard. 2019. **Exposure to glyphosate-based herbicides and risk for Non-Hodgkin Lymphoma: A meta-analysis and supporting evidence.** *Mutation Research/Rev in Mut Res:* (Available online 10 February 2019).
https://www.sciencedirect.com/science/article/pii/S1383574218300887?mc_cid=23c18e62e7&mc_eid=ff8c3a64ef
Glyphosate is the most widely used broad-spectrum systemic herbicide in the world. Recent evaluations of the carcinogenic potential of glyphosate-based herbicides (GBHs) by various regional, national, and international agencies have engendered controversy. We investigated whether there was an association between high cumulative exposures to GBHs and increased risk of non-Hodgkin lymphoma (NHL) in humans. We conducted a new meta-analysis that includes the most recent update of the Agricultural Health Study (AHS) cohort published in 2018 along with five case-control studies. Using the highest exposure groups when available in each study, we report the overall meta-relative risk (meta-RR) of NHL in GBH-exposed individuals was increased by 41% (meta-RR=1.41, 95% confidence interval, CI: 1.13–1.75). For comparison, we also performed a secondary meta-analysis using high-exposure groups with the earlier AHS (2005), and we calculated a meta-RR for NHL of 1.45 (95% CI: 1.11–1.91), which was higher than the meta-RRs reported previously. Multiple sensitivity tests conducted to assess the validity of our findings did not reveal meaningful differences from our primary estimated meta-RR. To contextualize our findings of an increased NHL risk in individuals with high GBH exposure, we reviewed publicly available animal and mechanistic studies related to lymphoma. We documented further support from studies of malignant lymphoma incidence in mice treated with pure glyphosate, as well as potential links between glyphosate / GBH exposure and immunosuppression, endocrine disruption, and genetic alterations that are commonly associated with NHL or lymphomagenesis. Overall, in accordance with findings from experimental animal and mechanistic studies, our current meta-analysis of human epidemiological studies suggests a compelling link between exposures to GBHs and increased risk for NHL.

— CANCER AND OTHER HEALTH ISSUES —

9)••Samsel A & S Seneff. 2014. **Glyphosate, pathways to modern diseases IV: cancer and related pathologies.** *J Biol Phys and Chem:* 15 (2015) 121–159.
doi: 10.4024/11SA15R.jbpc.15.03 https://www.drperlmutter.com/wp-content/uploads/2016/03/Glyphosate_pathways_to_modern_diseases_IV_cancer_and_related_pathologies.pdf
Glyphosate is the active ingredient in the pervasive herbicide, Roundup, and its usage, particularly in the United States, has increased dramatically in the last two decades, in step with the widespread adoption of Roundup®-Ready core crops. The World Health Organization

recently labelled glyphosate as "probably carcinogenic." In this paper, we review the research literature, with the goal of evaluating the carcinogenic potential of glyphosate. Glyphosate has a large number of tumorigenic effects on biological systems, including direct damage to DNA in sensitive cells, disruption of glycine homeostasis, succinate dehydrogenase inhibition, chelation of manganese, modification to more carcinogenic molecules such as N-nitrosoglyphosate and glyoxylate, disruption of fructose metabolism, etc. Epidemiological evidence supports strong temporal correlations between glyphosate usage on crops and a multitude of cancers that are reaching epidemic proportions, including breast cancer, pancreatic cancer, kidney cancer, thyroid cancer, liver cancer, bladder cancer and myeloid leukaemia. Here, we support these correlations through an examination of Monsanto's early studies on glyphosate, and explain how the biological effects of glyphosate could induce each of these cancers. We believe that the available evidence warrants a reconsideration of the risk/benefit trade-off with respect to glyphosate usage to control weeds, and we advocate much stricter regulation of glyphosate.

---

10)••Samsel A & S Seneff. 2017. **Glyphosate pathways to modern diseases VI: Prions, amyloidoses and autoimmune neurological diseases.** *J Biol Phys and Chem:*17 (2017) 8–32. **https://www.researchgate.net/publication**
316601847_Glyphosate_pathways_to_modern_diseases_VI_Prions_amyloidoses_and_autoimmune_neurological_diseases
Usage of the herbicide glyphosate on core crops in the USA has increased exponentially over the past two decades, in step with the exponential increase in autoimmune diseases including autism, multiple sclerosis, inflammatory bowel disease, type 1 diabetes, coeliac disease, neuromyelitis optica and many others. In this paper we explain how glyphosate, acting as a non-coding amino acid analogue of glycine, could erroneously be integrated with or incorporated into protein synthesis in place of glycine, producing a defective product that resists proteolysis. Whether produced by a microbe or present in a food source, such a peptide could lead to autoimmune disease through molecular mimicry. We discuss similarities in other naturally produced disease-causing amino acid analogues, such as the herbicide glufosinate and the insecticide L-canavanine, and provide multiple examples of glycine-containing short peptides linked to autoimmune disease, particularly with respect to multiple sclerosis. Most disturbing is the presence of glyphosate in many popular vaccines including the measles, mumps and rubella (MMR) vaccine, which we have verified here for the first time. Contamination may come through bovine protein, bovine calf serum, bovine casein, egg protein and/or gelatin. Gelatin sourced from the skin and bones of pigs and cattle given glyphosate-contaminated feed contains the herbicide. Collagen, the principal component of gelatin, contains very high levels of glycine, as do the digestive enzymes: pepsin, trypsin and lipase. The live measles virus could produce glyphosate-containing haemagglutinin, which might induce an autoimmune attack on myelin basic protein, commonly observed in autism. Regulatory agencies urgently need to reconsider the risks associated with the indiscriminate use of glyphosate to control weeds.

---

11)••Parvez S, RR Gerona, C Proctor, M Friesen, JL Ashby, JL Reiter, Z Lui & PD Winchester. 2018. **Environmental Health Glyphosate exposure in pregnancy and shortened gestational length: a prospective Indiana birth cohort study.** *Environmental Health*: 17, Article number: 23 (2018).
https://ehjournal.biomedcentral.com/articles/10.1186/s12940-018-0367-0
The mean age of participants was 29 years, and the majority were Caucasian. Ninety three percent of the pregnant women had GLY levels above the limit of detection (0.1 ng/mL). Mean urinary GLY was 3.40 ng/mL (range 0.5–7.20 ng/mL). Higher GLY levels were found in women who lived in rural areas (p =0.02), and in those who consumed >24 oz. of caffeinated beverages per day (p =0.004). None of the drinking water samples had detectable GLY levels. We observed no correlations with fetal growth indicators such as birth weight percentile and

head circumference. However, higher GLY urine levels were significantly correlated with shortened gestational lengths ($r=-0.28$, $p=0.02$). This is the first study of GLY exposure in US pregnant women using urine specimens as a direct measure of exposure. We found that >90% of pregnant women had detectable GLY levels and that these levels correlated significantly with shortened pregnancy lengths. Although our study cohort was small and regional and had limited racial/ethnic diversity, it provides direct evidence of maternal GLY exposure and a significant correlation with shortened pregnancy. Further investigations in a more geographically and racially diverse cohort would be necessary before these findings could be generalized.

---

12)••Duforeste M, A Nadaradjane, G Bougras-Cartron, J Briand, C Olivier, Jean-Sébastien Frenel, F. M. Vallette, SA Lelièvre & Pierre-François Cartron. 2019. **Glyphosate Primes Mammary Cells for Tumorigenesis by Reprogramming the Epigenome in a TET3-Dependent Manner.** *Front Genet:* 27 September 2019.
https://doi.org/10.3389/fgene.2019.00885
https://www.frontiersin.org/articles/10.3389/fgene.2019.00885/full
The acknowledgment that pollutants might influence the epigenome raises serious concerns regarding their long-term impact on the development of chronic diseases. The herbicide glyphosate has been scrutinized for an impact on cancer incidence, but reports demonstrate the difficulty of linking estimates of exposure and response analysis. An approach to better apprehend a potential risk impact for cancer is to follow a synergistic approach, as cancer rarely occurs in response to one risk factor. The known influence of glyphosate on estrogen-regulated pathway makes it a logical target of investigation in breast cancer research. We have used nonneoplastic MCF10A cells in a repeated glyphosate exposure pattern over 21 days. Glyphosate triggered a significant reduction in DNA methylation, as shown by the level of 5-methylcytosine DNA; however, in contrast to strong demethylating agent and cancer promoter UP peptide, glyphosate-treated cells did not lead to tumor development. Whereas UP acts through a DNMT1/PCNA/UHRF1 pathway, glyphosate triggered increased activity of ten-eleven translocation (TET)3. Combining glyphosate with enhanced expression of microRNA (miR) 182-5p associated with breast cancer induced tumor development in 50% of mice. Culture of primary cells from resected tumors revealed a luminal B (ER+/PR-/HER2-) phenotype in response to glyphosate-miR182-5p exposure with sensitivity to tamoxifen and invasive and migratory potentials. Tumor development could be prevented either by specifically inhibiting miR 182-5p or by treating glyphosate-miR 182-5p-cells with dimethyloxallyl glycine, an inhibitor of TET pathway. Looking for potential epigenetic marks of TET-mediated gene regulation under glyphosate exposure, we identified MTRNR2L2 and DUX4 genes, the hypomethylation of which was sustained even after stopping glyphosate exposure for 6 weeks. Our findings reveal that low pressure but sustained DNA hypomethylation occurring via the TET pathway primes cells for oncogenic response in the presence of another potential risk factor. These results warrant further investigation of glyphosate-mediated breast cancer risk.

---

13)••Kubsad D, E E Nilsson, S E King, I S-Riggleman, D Beck & M K Skinner. 2019. **Assessment of Glyphosate Induced epigenetic transgenerational Inheritance of pathologies and sperm epimutations: Generational toxicology. Scientific RepoRts |** (2019) 9:6372 | https://doi.org/10.1038/s41598-019-42860-0
https://skinner.wsu.edu/documents/2019/04/2019-kubsad-etal-glyphosate-scientificreports.pdf/
Ancestral environmental exposures to a variety of factors and toxicants have been shown to promote the epigenetic transgenerational inheritance of adult onset disease. one of the most widely used agricultural pesticides worldwide is the herbicide glyphosate (N-(phosphonomethyl)glycine), commonly known as Roundup. There are an increasing number of conflicting reports regarding the direct exposure toxicity (risk) of glyphosate, but no rigorous investigations on the generational actions. the current study using a transient exposure of gestating F0 generation female rats found negligible impacts of glyphosate on the directly exposed F0 generation, or F1 generation offspring pathology. In contrast, dramatic increases in

pathologies in the F2 generation grand-offspring, and F3 transgenerational great- grand-offspring were observed. The transgenerational pathologies observed include prostate disease, obesity, kidney disease, ovarian disease, and parturition (birth) abnormalities. epigenetic analysis of the F1, F2 and F3 generation sperm identified differential DNA methylation regions (DMRs). A number of DMR associated genes were identified and previously shown to be involved in pathologies. Therefore, we propose glyphosate can induce the transgenerational inheritance of disease and germline (e.g. sperm) epimutations. observations suggest the generational toxicology of glyphosate needs to be considered in the disease etiology of future generations. Glyphosate (N-(phosphonomethyl)glycine) was discovered in 1950 and was commercialized for its herbicidal activity as Roundup in the 1970s by Monsanto, St. Louis Missouri1. Glyphosate is the world's most commonly used herbicide accounting for nearly 72% of global pesticide usage1. It is the primary herbicide used in the agriculture of corn, soy, and canola, with extensive use in the USA, Supplemental Figure S1. The current "safe"

---

14)••Kurenbach B, AM Hill, W Godsoe, S van Hamelsveld, JA Heinemann. 2018. **Agrichemicals and antibiotics in combination increase antibiotic resistance evolution.** *PeerJ* 6:e5801 https://doi.org/10.7717/peerj.5801

Antibiotic resistance in our pathogens is medicine's climate change: caused by human activity, and resulting in more extreme outcomes. Resistance emerges in microbial populations when antibiotics act on phenotypic variance within the population. This can arise from either genotypic diversity (resulting from a mutation or horizontal gene transfer), or from differences in gene expression due to environmental variation, referred to as adaptive resistance. Adaptive changes can increase fitness allowing bacteria to survive at higher concentrations of antibiotics. They can also decrease fitness, potentially leading to selection for antibiotic resistance at lower concentrations. There are opportunities for other environmental stressors to promote antibiotic resistance in ways that are hard to predict using conventional assays. Exploiting our previous observation that commonly used herbicides can increase or decrease the minimum inhibitory concentration (MIC) of different antibiotics, we provide the first comprehensive test of the hypothesis that the rate of antibiotic resistance evolution under specified conditions can increase, regardless of whether a herbicide increases or decreases the antibiotic MIC. Short term evolution experiments were used for various herbicide and antibiotic combinations. We found conditions where acquired resistance arises more frequently regardless of whether the exogenous non-antibiotic agent increased or decreased antibiotic effectiveness. This is attributed to the effect of the herbicide on either MIC or the minimum selective concentration (MSC) of a paired antibiotic. The MSC is the lowest concentration of antibiotic at which the fitness of individuals varies because of the antibiotic, and is lower than MIC. Our results suggest that additional environmental factors influencing competition between bacteria could enhance the ability of antibiotics to select antibiotic resistance. Our work demonstrates that bacteria may acquire antibiotic resistance in the environment at rates substantially faster than predicted from laboratory conditions.

— ANIMALS, MICROBES and FUNGI —

15)••Motta EVS, K Raymann, and NA Moran. 2018. **Glyphosate perturbs the gut microbiota of honey bees.** *Proc. Nat. Acad. Sci. (PNAS):* October 9, 2018 115 (41) 10305-10310. https://doi.org/10.1073/pnas.1803880115 https://www.pnas.org/content/115/41/10305

Glyphosate, the primary herbicide used globally for weed control, targets the 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS) enzyme in the shikimate pathway found in plants and some microorganisms. Thus, glyphosate may affect bacterial symbionts of animals living near agricultural sites, including pollinators such as bees. The honey bee gut microbiota is dominated by eight bacterial species that promote weight gain and reduce pathogen susceptibility. The gene encoding EPSPS is present in almost all sequenced

genomes of bee gut bacteria, indicating that they are potentially susceptible to glyphosate. We demonstrated that the relative and absolute abundances of dominant gut microbiota species are decreased in bees exposed to glyphosate at concentrations documented in the environment. Glyphosate exposure of young workers increased mortality of bees subsequently exposed to the opportunistic pathogen *Serratia marcescens*. Members of the bee gut microbiota varied in susceptibility to glyphosate, largely corresponding to whether they possessed an EPSPS of class I (sensitive to glyphosate) or class II (insensitive to glyphosate). This basis for differences in sensitivity was confirmed using in vitro experiments in which the EPSPS gene from bee gut bacteria was cloned into *Escherichia coli*. All strains of the core bee gut species, *Snodgrassella alvi*, encode a sensitive class I EPSPS, and reduction in *S. alvi* levels was a consistent experimental result. However, some *S. alvi* strains appear to possess an alternative mechanism of glyphosate resistance. Thus, exposure of bees to glyphosate can perturb their beneficial gut microbiota, potentially affecting bee health and their effectiveness as pollinators.

---

16)••Farina, W M, M. S Balbuena, L T Herbert, C Mengoni Goñalons and D E Vázquez. 2019. **Effects of the herbicide glyphosate on honey bee sensory and cognitive abilities: Individual impairments with implications for the hive.** *Insects* **2019, 10(10), 354**
https://doi.org/10.3390/insects10100354 (open access)
The honeybee Apis mellifera is an important pollinator in both undisturbed and agricultural ecosystems. Its great versatility as an experimental model makes it an excellent proxy to evaluate the environmental impact of agrochemicals using current methodologies and procedures in environmental toxicology. The increase in agrochemical use, including those that do not target insects directly, can have deleterious effects if carried out indiscriminately. This seems to be the case of the herbicide glyphosate (GLY), the most widely used agrochemical worldwide. Its presence in honey has been reported in samples obtained from different environments. Hence, to understand its current and potential risks for this pollinator it has become essential to not only study the effects on honeybee colonies located in agricultural settings, but also its effects under laboratory conditions. Subtle deleterious effects can be detected using experimental approaches. GLY negatively affects associative learning processes of foragers, cognitive and sensory abilities of young hive bees and promotes delays in brood development. An integrated approach that considers behavior, physiology, and development allows not only to determine the effects of this agrochemical on this eusocial insect from an experimental perspective, but also to infer putative effects in disturbed environments where it is omnipresent.
Key points include:
* In 2015, of the 179.9 million ha of global GMO crop area, about 84% contained crops that carried herbicide-resistant genes. Most GMO crops are engineered for tolerance to glyphosate herbicides.
* Glyphosate herbicides are also used on many non-GMO crops and in non-farm environments.
* Honeybees' ingestion of food containing high concentrations of glyphosate resulted in a higher proportion of disoriented foragers. Despite this, honeybees continued foraging from resources that contain glyphosate traces. These sublethal effects on their learning abilities could impact not only the foraging efficiency, but also the coordination of collective activities within the colony.
* Honeybees' ability to establish an association between an odour and a sucrose reward was impaired by an acute exposure to glyphosate.
* There is evidence that glyphosate diminishes short-term memory retention in honeybees.
* Honeybee colonies that are permanently exposed to glyphosate are likely to show a deficit in information propagation and nectar distribution.
* Glyphosate causes changes in gut microbiota and greater susceptibility to pathogens and malnutrition.
* Honeybee brood provided with food containing glyphosate traces were more likely to show delayed moulting and weighed less than control brood.

* Glyphosate acts as a stressor that affects larval development (manifested in in vitro exposure by a lower proportion of larvae achieving moulting success and reduced final weights), which could have implications for overall long-term colony survival.

---

17)••Zaller JG, F Heigl, L Ruess & A Grabmaier. 2014. **Glyphosate herbicide affects belowground interactions between earthworms and symbiotic mycorrhizal fungi in a model ecosystem.** *Sci Rep*. 2014; 4: 5634. doi: 10.1038/srep05634
Herbicides containing glyphosate are widely used in agriculture and private gardens, however, surprisingly little is known on potential side effects on non-target soil organisms. In a greenhouse experiment with white clover we investigated, to what extent a globally-used glyphosate herbicide affects interactions between essential soil organisms such as earthworms and arbuscular mycorrhizal fungi (AMF). We found that herbicides significantly decreased root mycorrhization, soil AMF spore biomass, vesicles and propagules. Herbicide application and earthworms increased soil hyphal biomass and tended to reduce soil water infiltration after a simulated heavy rainfall. Herbicide application in interaction with AMF led to slightly heavier but less active earthworms. Leaching of glyphosate after a simulated rainfall was substantial and altered by earthworms and AMF. These sizeable changes provide impetus for more general attention to side-effects of glyphosate-based herbicides on key soil organisms and their associated ecosystem services.

---

18)••Gaupp-Berghausen M, M Hofer, B Rewald, & J G Zaller. 2015. **Glyphosate-based herbicides reduce the activity and reproduction of earthworms and lead to increased soil nutrient concentrations.** *Sci Rep:* 2015; 5: 12886.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4542661/
Herbicide use is increasing worldwide both in agriculture and private gardens. However, our knowledge of potential side-effects on non-target soil organisms, even on such eminent ones as earthworms, is still very scarce. In a greenhouse experiment, we assessed the impact of the most widely used glyphosate-based herbicide Roundup on two earthworm species with different feeding strategies. We demonstrate, that the surface casting activity of vertically burrowing earthworms (*Lumbricus terrestris*) almost ceased three weeks after herbicide application, while the activity of soil dwelling earthworms (*Aporrectodea caliginosa*) was not affected. Reproduction of the soil dwellers was reduced by 56% within three months after herbicide application. Herbicide application led to increased soil concentrations of nitrate by 1592% and phosphate by 127%, pointing to potential risks for nutrient leaching into streams, lakes, or groundwater aquifers. These sizeable herbicide-induced impacts on agroecosystems are particularly worrisome because these herbicides have been globally used for decades.

— CONTAMINATION of VEGETATION, AIR, WATER and SOIL —

19)••Anon. 2019. **Glyphosate use in forestry drifts on wild, edible plants, leading to lasting contamination.** *Beyond Pesticides/Daily News Blog*: March 5, 2019.
Wild, edible plants subject to drift from the herbicide glyphosate during forestry operations can be contaminated with the chemical an entire year after an initial application, according to a new study published in the Canadian Journal of Forest Research. Glyphosate is often used in forestry to knock down unwanted trees, shrubs, and other plants after clear-cutting to provide room for the regrowth of trees deemed valuable. However, this new research shows that "non-target" species, such as raspberries and blueberries, eaten by wildlife and sometimes wild foraged by humans can retain significant levels of glyphosate contamination due to drift and overspray. Forester Lisa Wood, PhD, from the University of Northern British Columbia began this research based on input and requests from Canadian indigenous First Nations communities. Back in 2013, shrubs foraged by traditional berry-pickers in northeastern British

Columbia were sampled and found to contain glyphosate residues, leading to the need for a broader investigation. Dr. Wood sampled the roots and shoots of 10 plant species from an area that had been aerially sprayed with glyphosate a year prior as part of forestry operations to clear aspen and make room for coniferous re-plantings. The 10 plants, which included highbush cranberry, prickly rose, bunchberry, pink wintergreen, blueberries and red raspberries, among others, were compared against those chosen from a control region where glyphosate was not applied. Results show that 12 of 23 plant shoots (new growth) sampled contain detectable levels of glyphosate one year after application, with some levels ranging over 1 ppm. The roots of plants contain higher levels on average, ranging from .1 ppm to over 4 ppm. Researchers specifically analyzed the fruit of raspberries and blueberries, finding average glyphosate levels of roughly .14 ppm. "If a plant dies from an application it falls to the soil and there are microbes that gobble up the glyphosate," Dr. Wood told the Vancouver Sun. "When they don't die, they have interesting ways of coping, often by storing and isolating the glyphosate." In general, plants appear to store glyphosate in their roots during dormancy, but translocate the chemical to shoots during the growing season. Dr. Wood found that lower growing plants appear to contain higher levels of glyphosate contamination than those farther from the ground.

---

20)••Anon. 2019. **Nutrient runoff, aquatic weed killers, and Florida's Red Tide collide in public debate.** *Beyond Pesticides/Daily News Blog*: March 6, 2019.

After a brief hiatus, Florida Fish and Wildlife Conservation Commission (FWC) is continuing use of aquatic herbicides, including glyphosate, for invasive species management. Public pressure and feedback caused FWC to take a temporary pause from spraying while the commission collected public comment through public hearings and emails from late January through February. FWC ultimately decided to resume spraying invasive species, and points to its improved integrated management system as reducing overall herbicide use. Glyphosate, one of the 17 aquatic herbicides that FWC uses regularly has sparked opposition from environmentalists and the general public due to its wide usage and known adverse effects. According to FWC data, 12,263 pounds of glyphosate-based herbicides were used on Florida's Lake Okeechobee in 2017. About 175,000 people have signed North Palm Beach photographer and wildlife advocate Jim Abernathy's petition titled "Stop The State-Sanctioned Poisoning of Our Lakes and Rivers!". The petition decries the use of glyphosate to kill invasive aquatic plants and warns of subsequent nutrient pollution caused by decay. An excess of nutrients (e.g. nitrogen and phosphorus) in water bodies contribute to algal blooms. Eutrophication can eventually result in oxygen depletion and thereby decrease biodiversity. FWC denies that the invasive species management program contributes to either red tide (discoloration caused by an explosion of algae) or blue/green algae build up, citing lack of evidence and asserting that keeping low populations of the plant reduces buildup of decaying plant material.

Invasive aquatic plants, such as water hyacinth and hydrilla, plague Florida's waterways. They displace native plant communities and disrupt recreation – particularly waterhyacinth, which can get so thick as to be impassable. Water hyacinth is a free-floating aquatic plant native to Amazon River in Brazil. Mature plants reproduce rapidly through horizontal stolons; populations can double in as little as 6-18 days. Mechanical means of management are difficult, as dense populations can weigh as much as 400 tons per acre. The plant then needs to be taken away from the waterway, and disposal can be expensive and time consuming. In response to the question, "Why can't the FWC just use mechanical control and eliminate the use of herbicides?," FWC noted:

"*Research and tests conducted on Lake Okeechobee and other waterways throughout the state have consistently shown that mechanical harvesters alone are ineffective for large-scale control of these fast-growing exotics. In past tests, when harvesters replaced chemicals on Lake Okeechobee, the plants multiplied faster than they could be harvested, lake conditions became unsuitable for navigation and recreation, and there was a significant loss of native*

habitat. One crew applying herbicide can cover approximately 10 acres a day, whereas a crew operating a harvester can typically clear only .5 acre a day. Some biological controls can have moderate success on some types of plants but, despite many research efforts, we have not found a biological control agent that provides good results on floating plants such as water hyacinths."

Those who use alternatives say that employing nonchemical strategies requires different approaches than chemical-intensive strategies. For example, timing of harvesting and the use of biological controls becomes an important factor in efficacy of these non-chemical approaches. Additionally, economists evaluating the cost of pesticide use in comparison with nonchemical approaches have evaluated secondary costs, such as those associated with adverse health effects, contamination, clean-up costs, weed resistance, and more. In most cases, chemical-intensive approaches are inherently more expensive.

Florida residents are concerned about the impact on people and wildlife of chemicals used, while FWC responds to this apprehension with the position that, "Herbicides registered for use in aquatic environments undergo years of rigorous evaluation with the U.S. Environmental Protection Agency (EPA)." Additionally, FWC states that it works with universities and research institutions for "environmentally compatible and cost-effective strategies to apply herbicides to control target vegetation while conserving or enhancing non-target plants and animals."

However, with industry-influenced research and a history of negligence regarding the potential harm associated with undisclosed pesticide product ingredients (inerts), independent critiques have found EPA's pesticide evaluation process to be inadequate.

While not ending herbicide use entirely, FWC is "recommitting to employing methods that minimize the quantity of herbicides needed to achieve the desired level of control." A **news release** from March 1, 2019 details their improvements as:

- Accelerating the development of habitat management plans for individual lakes.
- Forming a Technical Assistance Group consisting of staff, partners and stakeholders.
- Improving the timing of herbicide-based invasive aquatic plant treatments.
- Exploring ways to better integrate and increase the strategic use of mechanical aquatic plant harvesting.
- Exploring new methods and technologies to oversee and increase accountability of aquatic plant control contractors.
- Developing pilot projects to explore better integrated plant management tools.
- Improving agency communication regarding plant management activities.

Read Beyond Pesticides' 2018 article "**Meeting the 'Invasive Species' Challenge**" or our "**Least-toxic Control of Weeds**" for more information about Beyond Pesticides' approach to weed management.

---

21)••USGS. 2017. **Common Weed Killer is Widespread in the Environment**
https://toxics.usgs.gov/highlights/2014-04-23-glyphosate_2014.html

U.S. Geological Survey (USGS) scientists report that glyphosate and its degradation product AMPA (aminomethylphosphonic acid) are transported off-site from agricultural and urban sources and occur widely in the environment. This study is the largest and most comprehensive assessment of the environmental occurrence of glyphosate and AMPA in the United States conducted to date, summarizing the results of 3,732 environmental samples collected between 2001 and 2010 from 38 states.

- Glyphosate and, or AMPA were detected commonly in surface waters (59 percent of 470 sites), and infrequently in groundwater or soil water (8.4 percent of 820 sites).
- Glyphosate was detected in more than 50 percent of soil and sediment samples, and water samples from ditches and drains, precipitation, large rivers, and streams.
- Glyphosate was detected in less than 40 percent of water samples from lakes, ponds, wetlands.
- AMPA was detected more frequently than glyphosate in all environmental settings except lakes, ponds, and wetlands.

- AMPA was detected in more than 80 percent of wastewater treatment plant samples; while glyphosate was detected in only about 10 percent of those samples.
- Data from nine surface-water sites sampled repeatedly indicate that glyphosate and AMPA detection frequency, median concentrations, and loads are higher late in the study period (2006-2010) than early (2001-2005).

---

22)••LL Alonso, PM Demetrio, M Agustina Etchegoyen & DJ Marino. 2018. **Glyphosate and atrazine in rainfall and soils in agroproductive areas of the pampas region in Argentina.** *Sci Total Environ.* 2018 Dec 15;645:89-96. doi: 10.1016/j.scitotenv.2018.07.134
The presence in the atmosphere of glyphosate (GLP) and atrazine (ATZ) was investigated-those pesticides dominating the market in Argentina-through rain, as the main climatic phenomenon associated with wet deposition, both through analyzing source-receptor relationships with soil along with the climatic influences that may condition that transport and through estimating the annual deposition on the surface of the Argentine pampas. Rainwater samples (n = 112) were collected throughout each rainfall in urban areas of the pampas having different degrees of land use and with extensive crop production plus subsurface-soil samples (n = 58) from the relevant periurban sites. The herbicides-analyzed by liquid-chromatography-mass-spectrometry-were detected in >80% of the rain samples at median-to-maximum concentrations of 1.24-67.3 μg·L-1 (GLP) and 0.22-26.9 μg·L-1(ATZ), while aminomethylphosphonic acid (AMPA) was detected at 34% (0.75-7.91 μg·L-1). In soils, GLP was more frequently registered (41%; 102-323 μg·kg-1) followed by ATZ (32%; 7-66 μg·kg-1) and then AMPA (22%; 223-732 μg·kg-1). The maximum GLP concentrations quantified in rainwater exceeded the previously reported levels for the USA and Canada. No associations were observed between soil and rainwater concentrations in the same monitoring areas-despite the soil's action as a source, as evidenced through the AMPA present in rainwater. Median GLP concentrations were significantly associated with isohyets, in an increasing gradient from the east to the west-as such in an inverse pattern to that of the annual rainfall volumes; whereas ATZ-rainwater levels exhibited no characteristic spatial configuration. The estimated annual deposition of GLP by rainfall indicated that more than one source of a herbicide can lead to its presence in the atmosphere and points out the relevance of rainfall's contribution to the surface levels of a pollutant.

---

23)••Grosa P, A Ahmed, O Kühn & P Leinwebera. 2017. **Glyphosate binding in soil as revealed by sorption experiments and quantum-chemical modeling**. *Sci Tot Envir* 586: 15 May 2017; 527-535. https://doi.org/10.1016/j.scitotenv.2017.02.007
The herbicide glyphosate (GLP) is supposed to be rapidly degraded or adsorbed strongly by soil solids but findings in soil years after application and concentrations in waters above legal limits question a harmless disappearance. Therefore, we conducted batch sorption experiments with 23 thoroughly characterized arable surface soils, correlated isotherm coefficients with numerous inorganic and organic soil parameters, and investigated GLP-SOM-complexes by quantum-chemical modeling. The Freundlich sorption model yielded the best fits, and coefficients *Kf* and nf were correlated positively with the contents of clay/silt. The contents of organic C (Corg) and of the mass-spectrometrically determined SOM-compound classes carbohydrates, phenols/lignin monomers, lignin dimers, lipids, alkylaromatics, non-amide N and amides and sterols all were strongly positively correlated with the Freundlich coefficients. Quantum-chemical modeling showed that both GLP phosphonic and carboxylic functional groups interact similarly with the polar SOM functional groups via H-bond formation but the GLP phosphonic moiety is most important in the GLP-SOM-interaction. Moreover, the interaction mechanism between GLP and every modeled SOM-compound class was explored indicating the importance of the polarity, electron density, and site of attack of the SOM fragments in the GLP-SOM-interaction. Partial binding energies were combined to a total binding energy (*EB,tot*) of GLP to the SOM, considering the mass spectrometrically quantified compound classes for each individual soil sample. The resulting strongly positive correlation

between the *EB,tot* and the Corg provided compelling new experimental-theoretical evidence for the importance of SOM on the GLP binding and its behavior in the environment. In conclusion, the multitude of binding mechanisms to clay minerals and organic colloids make the occurrence of free GLP rather unlikely but a leaching of GLP complexes via preferential flow path through soil and transfer to waterways rather likely.

---

24)••Hébert, Marie-Pier , V Fugère & A Gonzalez. 2019. **The overlooked impact of rising glyphosate use on phosphorus loading in agricultural watersheds.** *Front Ecol Envir* 17 (issue 1): 48-56.
Glyphosate is the most extensively used pesticide worldwide. In addition to raising ecotoxicological concerns, the use of glyphosate adds phosphorus (P) to agricultural landscapes, influencing the accumulation and cycling of P in soil and nearby surface waters. Yet pesticides have been largely ignored when monitoring anthropogenic sources of P in agricultural watersheds. Estimating the supply of P derived from glyphosate use, both globally and in the US alone, we show that trends have markedly increased over the past two decades. Across the US, mean inputs of glyphosate-derived P increased from 1.6 kg P km–2 in 1993 to 9.4 kg P km–2 in 2014, with values frequently exceeding 20 kg P km–2 in areas planted with glyphosate-resistant crops. Although still a minor source of P relative to fertilizers, P inputs from glyphosate use have now reached levels comparable to those from sources for which P regulations were initiated in the past. We thus argue for greater recognition of glyphosate's influence on P flow in watershed research and management.
In a nutshell:

- The herbicide glyphosate dominates the global pesticide market, with applied tonnage increasing steadily worldwide
- Glyphosate's capacity to degrade rapidly is often used to argue against potential toxicological effects, but the phosphorus (P) it contains persists in the environment and can influence soil P accumulation and losses to surrounding freshwater systems, which are prone to nutrient pollution
- Although pesticides are typically regarded as negligible sources of nutrients, we argue that the recent and rapid rise in glyphosate use has magnified its relative importance as a source of anthropogenic P, especially in areas of intensive corn, soybean, and cotton cultivation
- Glyphosate inputs should be considered in P assessments and sustainable management programs in agricultural watersheds; with glyphosate use increasing globally, it is imperative that we broaden the discourse of its environmental impacts

---

25)••Pesticide Action Network/Europe. 2017. **New Study: Glyphosate persists! And European top soils are contaminated with it.** PAN/Eur Press Release: October 13, 2017
(Contact: PAN Europe, Angeliki Lysimachou, +32 496 392930)
Research from the European Commission's Joint Research Centre and two Dutch laboratories shows that 45% of Europe's top soil contains glyphosate residues, demonstrating the over-reliance of the EU agricultural model on this harmful herbicide chemical. In contrast to what its manufactures[2] purport, glyphosate persists in soils affecting not only soil fertility and crop quality, but also human and environmental health
The -research by the Dutch University of Wageningen and Rikilt laboratories, jointly with the JRC, reveals that among 317 EU soil samples of arable land, 42% contained AMPA, the most toxic metabolite of glyphosate, while glyphosate was found in 21% of the soils; 18% of the samples had both. The study was conducted in six crop systems along 11 EU member states comprising soils under different geographical and climatic conditions. Denmark, the UK and Portugal are the worst in this spectrum, with the highest detection frequency, while Italy and Greece seem to be the ones using less glyphosate on their crops. However, and most notably, these 2 molecules could be found in every tested member state. All tested crops presented glyphosate and AMPA residues. By far, the worst case was that of Portuguese vineyards, while no crops exhibited patterns of reduced reliance on glyphosate compared to others. The results

prove that the accumulation and persistence of glyphosate in soil is underestimated by European authorities, as is the harm it may cause to environmental ecosystems. The concentrations of glyphosate and AMPA found in the study have been shown to be toxic to soil organisms such as earthworms, beneficial bacteria and fungi, as glyphosate weakens down plants' natural defences making them susceptible to pathogens[. These substances that get adsorbed by soil particles are not immobile, but can propagate through wind or rainfall, leading to air pollution and exposure through the atmosphere as well as contamination of surface and ground waters. The application of fertilisers may also release a fraction of the glyphosate and AMPA bound in particles, making it directly bioavailable for uptake by plants and organisms.
Angeliki Lyssimachou, PAN Europe's ecotoxicologist said: 'This study clearly contradicts the predictions of European Authorities that glyphosate does not persist in the environment. In fact European agriculture is highly reliant on a toxic substance that is not even properly regulated in the EU, putting everyone at risk. Policy makers must stop the use of these harmful chemicals in the production of our food. It is more than time to implement all existing non-chemical alternatives to herbicides'.
Henriette Christensen, PAN Europe's agriculture policy officer added 'Over the last years, a growing body of evidence shows that soil health is one of the main drivers of growing healthy crops that will resist to pest attacks. Glyphosate destroys soil health and leads to more pesticide uses. Our farmers must leave this vicious circle'.

---

26)••Martinez DA, UE Loening & MC Graham. 2018. **Impacts of glyphosate-based herbicides on disease resistance and health of crops: a review.** *Environ Sci Eur* (2018) 30: 2. https://doi.org/10.1186/s12302-018-0131-7
Based on experimental data from laboratory and field, numerous authors have raised concern that exposure to glyphosate-based herbicides (GBHs) may pre-dispose crops to damage by microbial pathogens. In this review, we distinguish and evaluate two principal pathways by which GBHs may affect the susceptibility of crops to disease: pathway 1—via disruptions to rhizosphere microbial ecology, and pathway 2—via restriction of nutrients to crops. We conclude that GBHs have the potential to undermine crop health in a number of ways, including: (i) impairment of the innate physiological defences of glyphosate-sensitive (GS) cultivars by interruption of the shikimic acid pathway; (ii) impairment of physiological disease defences has also been shown to occur in some glyphosate-resistant (GR) cultivars, despite their engineered resistance to glyphosate's primary mode of action; (iii) interference with rhizosphere microbial ecology (in particular, GBHs have the potential to enhance the population and/or virulence of some phytopathogenic microbial species in the crop rhizosphere); and finally, (iv) the as yet incompletely elucidated reduction in the uptake and utilisation of nutrient metals by crops. Future progress will best be achieved when growers, regulators and industry collaborate to develop products, practices and policies that minimise the use of herbicides as far as possible and maximise their effectiveness when used, while facilitating optimised food production and security.

•••Dr. Stephen Frantz, Research Pathobiologist, Global Environmental Options (GEO), South Hadley, MA ~ Global Environmental Options LLC <frantzs@mac.com>

GLYPHOSATE - SCIENCE AND HARM

This is a supplement to the: TEMPLATE for use by MA towns to adopt a "NEW Organic Land Management Regulation for Turf and Landscapes on Town-Owned/Operated Property"; "Alternatives To Glyphosate-Based Herbicides"; "Massachusetts Towns with Glyphosate Controls"; and "1ppt Concentration POSTER". While those documents cite a considerable amount of important scientific literature, there was a need for something to enable a quick review of some older and of some newer research reports. Here, we begin with a 2015 review of scientific literature. Importantly, that article attracted the attention of U.S. Congressman Ted Lieu who recognized the egregious nature of this herbicide; he arranged for a 2016 GEO-led team of scientists to meet/educate Congressional Staff and EPA Scientific Staff in DC; he later issued a press release recommending the public to stop using RoundUp® because of the risk of cancer; and requested investigation of U.S. government agencies that had allowed registration and marketing of glyphosate-based herbicides. This underscores the value of educating ourselves and government decision-makers; in this case, it also paved the way for GEO's legislative and other activities to restrict glyphosate use in CA and elsewhere. These efforts continued after GEO relocated to Massachusetts in 2018 and joined forces in mid-2019 with POCCA Cape Cod (already active against glyphosate in MA). A major collaborative effort of POCCA and GEO (that includes this document) has become the ways and means for engaging town governments to replace applications of glyphosate (and other toxic pesticides) with organically-based practices on town-owned/operated properties. For this current effort, scientific literature is key — as is a broader understanding of the impact of glyphosate on people, animals, microbes, the general environment and the climate crisis. Hopefully, this collection of selected publications will help to fill-in lingering knowledge gaps; becoming better informed is the prelude to making change happen.

INTRODUCTION

1) Frantz S. 2015. **Misery in a bottle.** *LA Progressive:* October 20, 2015.
https://www.laprogressive.com/glyphosate/

A thoroughly documented 2015 review of: glyphosate science; associated health, environmental and political issues; organic importance; and advocacy for glyphosate to be added to California's Prop 65 list of carcinogens (it was added to the list about a year later).

---

2) Rushton S, A Spake & L Chariton. 2016. **The unintended consequences of using glyphosate (the main ingredient in the herbicide Roundup).** Sierra Club, January 2016.
https://content.sierraclub.org/grassrootsnetwork/sites/content.sierraclub.org.activistnetwork/files/teams/documents/The_Unintended_Consequences_of_Using_Glyphosate_Jan-2016.pdf

An excellent, well-documented review paper, covering: history; mobility in soil and water; environmental persistence, fate, and deleterious effects on numerous species (including people, especially children); and the advent of "super weeds".

---

3) Montgomery, D. 2017. **Sustaining life - from soil microbiota to gut microbiome.** *Pesticides and You:* Summer 2017, 17pp.
https://beyondpesticides.org/assets/media/documents/journal/bp-37.2-su17%20SustainingLife.pdf

This piece contains excerpts from a talk at Beyond Pesticides' 35th National Pesticide Forum, "Healthy Hives Healthy Lives, Healthy Land: Ecological and Organic Strategies for Regeneration" by David Montgomery, PhD, a McArthur Fellow, professor of geomorphology at the University of Washington, and author of several books, including Growing a Revolution, The Hidden Half of Nature, and Dirt. Rachel Carson, in her book Silent Spring wrote, "By their very

nature, chemical controls are self-defeating, for they have been devised and applied without taking into account the complex biological systems against which they have been blindly hurled. The chemicals may have been pretested against a few individual species, but not against living communities." In this vein, Dr. Montgomery, in this talk, brings modern scientific understanding to one of the most critical public health and environmental issues of the modern era—how complex microbial or biological systems that Ms. Carson identified are essential to the health of the soil microbiota and the gut microbiome in humans. Dr. Montgomery's complete talk can be viewed on Beyond Pesticides' YouTube channel at bp-dc.org/Forum17.

---

4) Anon. 2019. **Monsanto papers/Secret documents.**
https://www.baumhedlundlaw.com/toxic-tort-law/monsanto-roundup-lawsuit/monsanto-secret-documents/

The collection of documents known as The Monsanto Papers or The Monsanto Secret Documents are available and explain Monsanto and EPA ill deeds in detail. Baum Hedlund Aristei & Goldman is one of the leading law firms representing people across the nation in lawsuits against Monsanto. These personal injury and wrongful death lawsuits claim that exposure to the herbicide weed killer, Roundup, causes non-Hodgkin's lymphoma (NHL). These documents, obtained via Discovery (pre-trial civil procedure allowing the parties to obtain evidence from each other) allow people to see what is happening "behind the curtain" of secrecy that normally shrouds ongoing litigation. This collection provides links to internal Monsanto emails, text messages, company reports, studies and other memoranda.

USAGE

5) Benbrook, CM. **Trends in glyphosate herbicide use in the United States and globally.** *Environ Sci Eur:* 28, 3 (2016). doi:10.1186/s12302-016-0070-0
https://enveurope.springeropen.com/articles/10.1186/s12302-016-0070-0

Since 1974 in the U.S., over 1.6 billion kilograms of glyphosate active ingredient have been applied, or 19 % of estimated global use of glyphosate (8.6 billion kilograms). Globally, glyphosate use has risen almost 15-fold since so-called "Roundup Ready," genetically engineered glyphosate-tolerant crops were introduced in 1996. Two-thirds of the total volume of glyphosate applied in the U.S. from 1974 to 2014 has been sprayed in just the last 10 years. The corresponding share globally is 72 %. In 2014, farmers sprayed enough glyphosate to apply ~1.0 kg/ha (0.8 pound/acre) on every hectare of U.S.-cultivated cropland and nearly 0.53 kg/ha (0.47 pounds/acre) on all cropland worldwide. Genetically engineered herbicide-tolerant crops now account for about 56 % of global glyphosate use. In the U.S., no pesticide has come remotely close to such intensive and widespread use. This is likely the case globally, but published global pesticide use data are sparse. Glyphosate will likely remain the most widely applied pesticide worldwide for years to come, and interest will grow in quantifying ecological and human health impacts. Accurate, accessible time-series data on glyphosate use will accelerate research progress.

HEALTH EFFECTS

6) IARC. 2015. **Some organophosphate insecticides and herbicides/ IARC Working Group on the Evaluation of Carcinogenic Risks to Humans.** *IARC monographs on the evaluation of carcinogenic risks to humans*: V.112. Lyon, France - 2017.
https://monographs.iarc.fr/wp-content/uploads/2018/07/mono112.pdf

Lyon, France, 20 March 2015 – The International Agency for Research on Cancer (IARC), the

specialized cancer agency of the World Health Organization, has assessed the carcinogenicity of five organophosphate pesticides. The herbicide glyphosate and the insecticides malathion and diazinon were classified as probably carcinogenic to humans (Group 2A).

For the herbicide glyphosate, there was limited evidence of carcinogenicity in humans for non-Hodgkin lymphoma. The evidence in humans is from studies of exposures, mostly agricultural, in the USA, Canada, and Sweden published since 2001. In addition, there is convincing evidence that glyphosate also can cause cancer in laboratory animals. On the basis of tumours in mice, the United States Environmental Protection Agency (U.S. EPA) originally classified glyphosate as possibly carcinogenic to humans (Group C) in 1985. After a re-evaluation of that mouse study, the U.S. EPA changed its classification to evidence of non-carcinogenicity in humans (Group E) in 1991. The US EPA Scientific Advisory Panel noted that the re-evaluated glyphosate results were still significant using two statistical tests recommended in the IARC Preamble. The IARC Working Group that conducted the evaluation considered the significant findings from the U.S. EPA report and several more recent positive results in concluding that there is sufficient evidence of carcinogenicity in experimental animals. Glyphosate also caused DNA and chromosomal damage in human cells, although it gave negative results in tests using bacteria. One study in community residents reported increases in blood markers of chromosomal damage.

Glyphosate currently has the highest global production volume of all herbicides. The largest use worldwide is in agriculture. The agricultural use of glyphosate has increased sharply since the development of crops that have been genetically modified to make them resistant to glyphosate. Glyphosate is also used in forestry, urban, and home applications.

What does Group 2A mean?
Group 2A means that the agent is probably carcinogenic to humans. This category is used when there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals. Limited evidence means that a positive association has been observed between exposure to the agent and cancer but that other explanations for the observations (called chance, bias, or confounding) could not be ruled out. This category is also used when there is limited evidence of carcinogenicity in humans and strong data on how the agent causes cancer.(micronuclei) after glyphosate formulations were sprayed nearby.

---

7) Portier CJ, BK Armstrong, BC Baguley, et al. 2016. **Differences in the carcinogenic evaluation of glyphosate between the International Agency for Research on Cancer (IARC) and the European Food Safety Authority (EFSA)**. *J Epidem Commun Health:* 70 (8). https://jech.bmj.com/content/70/8/741.full

The International Agency for Research on Cancer (IARC) Monographs Programme identifies chemicals, drugs, mixtures, occupational exposures, lifestyles and personal habits, and physical and biological agents that cause cancer in humans and has evaluated about 1000 agents since 1971. For Monograph 112, 17 expert scientists evaluated the carcinogenic hazard for four insecticides and the herbicide glyphosate. The WG concluded that the data for glyphosate meet the criteria for classification as a probable human carcinogen. The European Food Safety Authority (EFSA) is the primary agency of the European Union for risk assessments regarding food safety. In October 2015, EFSA reported on their evaluation of the Renewal Assessment Report (RAR) for glyphosate that was prepared by the Rapporteur Member State, the German Federal Institute for Risk Assessment (BfR). EFSA concluded that 'glyphosate is unlikely to pose a carcinogenic hazard to humans and the evidence does not support classification with regard to its carcinogenic potential'. Serious flaws in the scientific evaluation in the RAR incorrectly characterize the potential for a carcinogenic hazard from exposure to glyphosate. Since the RAR is the basis for the European Food Safety Agency (EFSA) conclusion, it is critical that these shortcomings are corrected.

---

8) Benbrook CM. 2019. **How did the US EPA and IARC reach diametrically opposed conclusions on the genotoxicity of glyphosate-based herbicides?** *Environ Sci Eur* (2019) 31: 2.
https://doi.org/10.1186/s12302-018-0184-7
EPA and IARC reached diametrically opposed conclusions on glyphosate genotoxicity for three primary reasons: (1) in the core tables compiled by EPA and IARC, the EPA relied mostly on registrant-commissioned, unpublished regulatory studies, 99% of which were negative, while IARC relied mostly on peer-reviewed studies of which 70% were positive (83 of 118); (2) EPA's evaluation was largely based on data from studies on technical glyphosate, whereas IARC's review placed heavy weight on the results of formulated glyphosate-based herbicide (GBH) and AMPA assays; (3) EPA's evaluation was focused on typical, general population dietary exposures assuming legal, food-crop uses, and did not take into account, nor address generally higher occupational exposures and risks. IARC's assessment encompassed data from typical dietary, occupational, and elevated exposure scenarios. More research is needed on real-world exposures to the chemicals within formulated GBHs and the biological fate and consequences of such exposures.

---

9) Samsel A & S Seneff. 2014. **Glyphosate, pathways to modern diseases IV: cancer and related pathologies.** *J Biol Phys and Chem:* 15 (2015) 121–159.
doi: 10.4024/11SA15R.jbpc.15.03

https://www.drperlmutter.com/wp-content/uploads/2016/03/Glyphosate_pathways_to_modern_diseases_IV_cancer_and_related_pathologies.pdf

Glyphosate is the active ingredient in the pervasive herbicide, Roundup, and its usage, particularly in the United States, has increased dramatically in the last two decades, in step with the widespread adoption of Roundup®-Ready core crops. The World Health Organization recently labelled glyphosate as "probably carcinogenic." In this paper, we review the research literature, with the goal of evaluating the carcinogenic potential of glyphosate. Glyphosate has a large number of tumorigenic effects on biological systems, including direct damage to DNA in sensitive cells, disruption of glycine homeostasis, succinate dehydrogenase inhibition, chelation of manganese, modification to more carcinogenic molecules such as N-nitrosoglyphosate and glyoxylate, disruption of fructose metabolism, etc. Epidemiological evidence supports strong temporal correlations between glyphosate usage on crops and a multitude of cancers that are reaching epidemic proportions, including breast cancer, pancreatic cancer, kidney cancer, thyroid cancer, liver cancer, bladder cancer and myeloid leukaemia. Here, we support these correlations through an examination of Monsanto's early studies on glyphosate, and explain how the biological effects of glyphosate could induce each of these cancers. We believe that the available evidence warrants a reconsideration of the risk/benefit trade-off with respect to glyphosate usage to control weeds, and we advocate much stricter regulation of glyphosate.

---

10) Samsel A & S Seneff. 2017. **Glyphosate, pathways to modern diseases VI: Prions, amyloidoses and autoimmune neurological diseases.** *J Biol Phys and Chem:* 17 (2017) 8–32. DOI: 10.4024/25SA16A.jbpc.17.01
https://www.researchgate.net/publication/316601847_Glyphosate_pathways_to_modern_diseases_VI_Prions_amyloidoses_and_autoimmune_neurological_diseases

Usage of the herbicide glyphosate on core crops in the USA has increased exponentially over the past two decades, in step with the exponential increase in autoimmune diseases including autism, multiple sclerosis, inflammatory bowel disease, type 1 diabetes, coeliac disease, neuromyelitis optica and many others. In this paper we explain how glyphosate, acting as a

IV-A.

MARCH 17, 2020
BOARD OF HEALTH MEETING

To: Board of Health
From: Meggan Eldredge, Health Director
Address: 7-Eleven/Syed Naqvi

This is a continued appeal hearing for violation of the Town of Harwich Tobacco Sales Regulation. Mr. Naqvi appealed the violation of selling tobacco products to a minor.

The Board of Health does not have the ability to reduce the minimum fine of $1000.00 for a first offense. Mr. Naqvi did not dispute the fact that a violation occurred. At last month's meeting Mr. Naqvi was disputing the amount of the fine and his financial ability to pay it. He aslo stated that he no longer owns the franchise and has returned the store to corporate.

At this point the Board has two options:

1. Find Mr. Naqvi responsible for the fine. Further appeals from Mr. Naqvi must be heard at the District Court.
2. Find Mr. Naqvi not responsible for the fine and dismiss it.

7-Eleven, Inc.

February 18, 2020

LNJ Convenience Inc.
Attn: Syed A. Naqvi
5 Main St.
West Harwich, MA 02671

Re: 7-Eleven Store No. 2709-34434B (the "Store")
Termination

Dear Syed:

This letter shall confirm that you informed 7-Eleven personnel that you desired to return the Store to 7-Eleven, and terminate the 7-Eleven Store Franchise Agreement (the "Agreement") entered into between you and 7-Eleven dated January 26, 2019.

This letter shall further confirm that 7-Eleven hereby acknowledges your desire to terminate the Agreement and that the Agreement will be terminated effective at 8 a.m. on February 18, 2020 (the "Termination Date"). A changeover audit will be performed at the Store at that time. The termination and closeout provisions of the Agreement shall apply to the termination.

You fully understand that the termination of the Franchise Agreement terminates all of your rights to sell Franchisee's goodwill or going concern value in the Store, to renew the Franchise Agreement, or to transfer to another 7-Eleven store.

Neither this letter nor any action taken by 7-Eleven in connection with the events described herein shall be deemed to be a waiver of any rights or claims 7-Eleven may have against you.

Please indicate your acceptance of the terms of this letter by signing below.

I have also attached a copy of the Release of Claims and Termination which you will sign on at the changeover.

If you have any questions do not hesitate to contact me.

Sincerely yours,

Michael Duvall
Market Manager

I accept the terms of this letter:

Syed 2/18

Syed A. Naqvi, Individually and on
Behalf of LNJ Convenience Inc.

V-A.

MARCH 17, 2020
BOARD OF HEALTH MEETING

To: Board of Health
From: Meggan Eldredge, Health Director
Applicant: The Deacons Folly Realty Trust
Address: 21 Deacons Folly Road

On behalf of the owner, Andrew Grover of Ryder & Wilcox, Inc. is applying for variances from Title 5, Section 310 CMR 15.211(1) as follows:

Variances from 310 CMR 15.211: Minimum Setbacks

1. Per 310 CMR 15.211(1): To allow a proposed soil absorption system to be 5' from the north and west property lines where 10' is required. Variance request of 5'.

2. Per 310 CMR 15.211(1): To allow a proposed soil absorption system to be 10' from a full foundation where 20' is required. Variance request of 10'.

The property has an existing 6-bedroom multi-family dwelling located on it, contains 21,190 square feet +/- of land and is bordered on the south by a wetland and Sand Pond. The majority of the property is within a buffer to a resource area. The existing 2 septic systems are comprised of septic tanks and leach pits and are proposed to be upgraded to a single system. Similarly, the existing multi-family dwelling is proposed to be rebuilt, in the same footprint, same number of bedrooms, reducing down to a single family residence rather than a two family residence. Due to the proximity to the resource area, an upgrade in fully compliance is not feasible. The project was approved by the Conservation Commission at their January 22, 2020 meeting.

I recommend approval of the variances with the following conditions:

1. Incorporation of an Innovative/Alternative septic system to reduce nitrogen impact to the resource.
2. An operation and maintenance agreement shall be in place prior to approval of the Certificate of Compliance.
3. Property shall be restricted to a maximum of 6 bedrooms.
4. Conditions shall be recorded at the Registry of Deeds.

Office Use Only
Filing Fee Paid/Amount: _____
Check #/Cash: _____
Date App Received: _____
Meeting Date: _____
Date Approved: _____
Date Denied: _____
Reason for Denial:
_____
_____

Town of Harwich
Board of Health
732 Main Street Harwich, MA 02645
508-430-7509 – Fax 508-430-7531
E-mail: health@town.harwich.ma.us

Application for Board of Health Variances

Date: 3/2/2020

Property Address: 21 Deacon's Folly Road

Map: 46 Parcel: X6

Book: 31849 Page: 130 Land Court No: _____

Name of Applicant: The Deacon's Folly Realty Trust

Applicant Mailing Address: 21 Deacon's Folly Road

Harwich, MA 02645

City State Zip Code

Applicant Telephone Number: _____

Applicant E-Mail Address: _____

Owner(s) of Record: The Deacon's Folly Realty Trust

Owner(s) Mailing Address: 21 Deacon's Folly Road

Harwich, MA 02645

City State Zip Code

Design Engineer/Sanitarian: Ryder & Wilcox, Inc - Andrew Grover R.S.

Firm/Company Name: Ryder & Wilcox, Inc

Mailing Address: PO Box 439

South Orleans, MA 02662

City State Zip Code

Telephone Number: 508-255-8312

Design Engineer/Sanitarian E-Mail Address: agrover@ryder-wilcox.com

Please Choose Application Type:

Voluntary Upgrade: X Addition/Alteration: ____ Failed System: ____ EIR: ____
Other: _____

Conservation Commission Approval Required: No: ___ Yes: X Date of CC Hearing: 1/22/2020

List All Variances from State & Local Codes

Title 5, Section #	Description of Variance(s):
310 CMR 15.211(1)	S.A.S. to north & west property lines: 5' proposed, 10' required, 5' variance requested.
310 CMR 15.211(1)	S.A.S. to full foundation: 10' proposed, 20' required, 10' variance requested.
Harwich Reg. #	**Description of Variance(s):**

In addition to this form, 8 packets of the following must be submitted by 4:00 p.m. on the filing deadline date:

- ☑ Letter to Board of Health
- ☑ Letter to abutters (bring certified mail receipts to the meeting)
- ☑ Copy of certified abutter list
- ☐ Existing variance letter (if applicable)
- ☑ Floor plans (all floors/existing & proposed)
- ☑ Site plan
- ☑ Filing Fee $125.00 (Variance)/$300.00 (EIR)

Ryder & Wilcox
SURVEYING · ENGINEERING
HOME PLANNING & DESIGN

3 GIDDIAH HILL ROAD · P.O. BOX 439
SO. ORLEANS, MASSACHUSETTS 02662-0439
TEL: 508.255.8312 FAX: 508.240.2306
EMAIL: info@ryder-wilcox.com

March 2, 2020

Harwich Board of Health, 732 Main Street, Harwich, MA

RE: Variance Request - 21 Deacon's Folly Road, Harwich, MA (Map 46 Parcel X6)

Dear Board Members,

On behalf of our clients, the Deacon's Folly Realty Trust, please reserve time at your next scheduled hearing, 3/17/2020, to consider a variance request under the State Environmental Code, Title 5, and the Harwich Board of Health Regulations to allow a septic system upgrade at the above referenced property.

The property of 21 Deacon's Folly Road has an existing 6-bedroom multifamily dwelling located on it, contains 21,190 square feet +/- of land, and is bordered on the south by a wetland and Sand Pond. The majority of the property is within a buffer to a resource area. The existing 2 septic systems are comprised of a septic tanks and leach pits and are proposed to be upgraded to a single system. Similarly the existing multi family dwelling is proposed to be rebuilt, in the same foot print, same number of bedrooms, reducing down to a single family residence rather than a two family residence. Due to the proximity to the resource area, an upgrade in full compliance with state and local regulations is not feasible.

As proposed, the new septic system for this site is a significant environmental improvement over the existing. The proposed 1500 gallon monopour septic tank, improves wastewater treatment as it allows for increased settling of solids and enhances anaerobic digestion of waste water constituents. The proposed soil absorption system increases the separation between the bottom of the system and groundwater, and will be outside the 100' setback to a wetland resource area.

In order to upgrade the on-site sewage treatment and disposal system the following variances are being requested:

State Environmental Code Title 5, 310 CMR 15.211 (1):

1. Soil absorption system to north and west property lines: 5± proposed, 10' required, 5'± variance requested.

2. Soil absorption system to full foundation: 10± proposed, 20' required, 10'± variance requested.

Enforcement of the provisions from which this relief is sought would be manifestly unjust considering the property is developed and has an existing septic system on it of which an upgrade in full compliance is not feasible due to the proximity of resource areas.

Although the proposed septic upgrade requires reductions in setback distances it is a significant improvement over the existing system and offers a level of environmental protection equivalent to that provided under the State Environmental Code, Title 5.

Included along with this letter are eight copies of the site plan, a set of floor plans, a list of abutters, and the abutter's notification letter. Please feel free to contact our office should you require any additional information. Thank you for your time and review of this project.

Sincerely,
Ryder & Wilcox, Inc.

Andrew P. Grover, R.S.

cc: The Deacon's Folly Realty Trust
Job# 12343

Ryder & Wilcox
SURVEYING · ENGINEERING
HOME PLANNING & DESIGN

3 GIDDIAH HILL ROAD · P.O. BOX 439
SO. ORLEANS, MASSACHUSETTS 02662-0439
TEL: 508.255.8312 FAX: 508.240.2306
EMAIL: info@ryder-wilcox.com

March 2, 2020

RE: Septic Variance Request
21 Deacon's Folly Road
Harwich, MA
Map 46 Parcel X6

Dear Abutter,

You are being notified pursuant to the State Environmental Code and the Harwich Board of Health Regulations that the Board of Health will hold a public hearing to consider a variance request from applicable state and local regulations. The variance is being requested to allow a septic upgrade at the above referenced property.

A copy of the letter requesting a hearing is enclosed. Copies of the site plan are on file with the health department and may be viewed prior to the public hearing to be held on March 17, 2020 in the Town Hall (Small Hearing Room), 732 Main Street, Harwich, MA. Hearings begin at 7:00 P.M.

Sincerely,

Ryder & Wilcox, Inc

Andrew Grover, R.S.

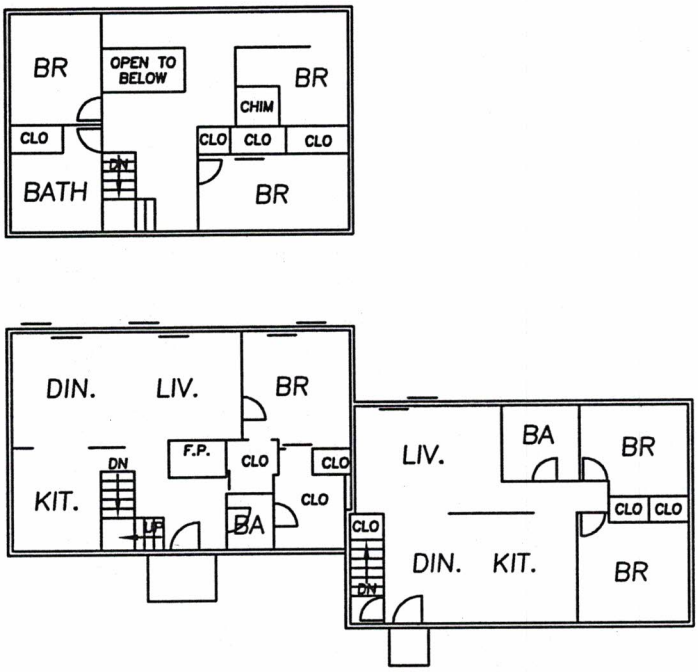
cc: The Deacon's Folly Realty Trust

Job# 12343

TOWN OF HARWICH, MA
BOARD OF ASSESSORS
732 Main Street, Harwich, MA 02645

Abutters List Within 50 feet of Parcel 46/X6/0

Key	Parcel ID	Owner	Location	Mailing Street	Mailing City	ST	ZipCd/Country
16192	46-M8-2-0-R	SHERMAN GLENN R & SHERMAN LISA F	20 DEACONS FOLLY RD	20 DEACONS FOLLY RD	HARWICH	MA	02645
16193	46-M8-3-0-R	SPEARMAN JAMES J ET AL CYNTHIA A CUTTING	24 DEACONS FOLLY RD	PO BOX 336	HARWICH	MA	02645
4684	46-X5-0-R	CHIEL JONATHAN & JACOBY CHIEL JUDITH	17 DEACONS FOLLY RD	22 CLEMENTS RD	NEWTON	MA	02458
4685	46-X6-0-R	SPRINGER MYRA LOUISE BURNS C/O TURANO-FLORES SARAH A TR Locus	21 DEACONS FOLLY RD	21 DEACONS FOLLY RD	HARWICH	MA	02645
11673	46-X7-A-0-R	CLIFFORD JOHN J JR TR ET AL CLIFFORD JOHN J JR TR	25 DEACONS FOLLY RD	25 DEACONS FOLLY RD	HARWICH	MA	02645



NOTE: DIMENSIONS ARE APPROXIMATE. THIS SKETCH IS FOR DETERMINING TOTAL BEDROOM COUNT FOR SEPTIC SYSTEM SIZING ONLY AND IS NOT INTENDED FOR ANY OTHER USE.

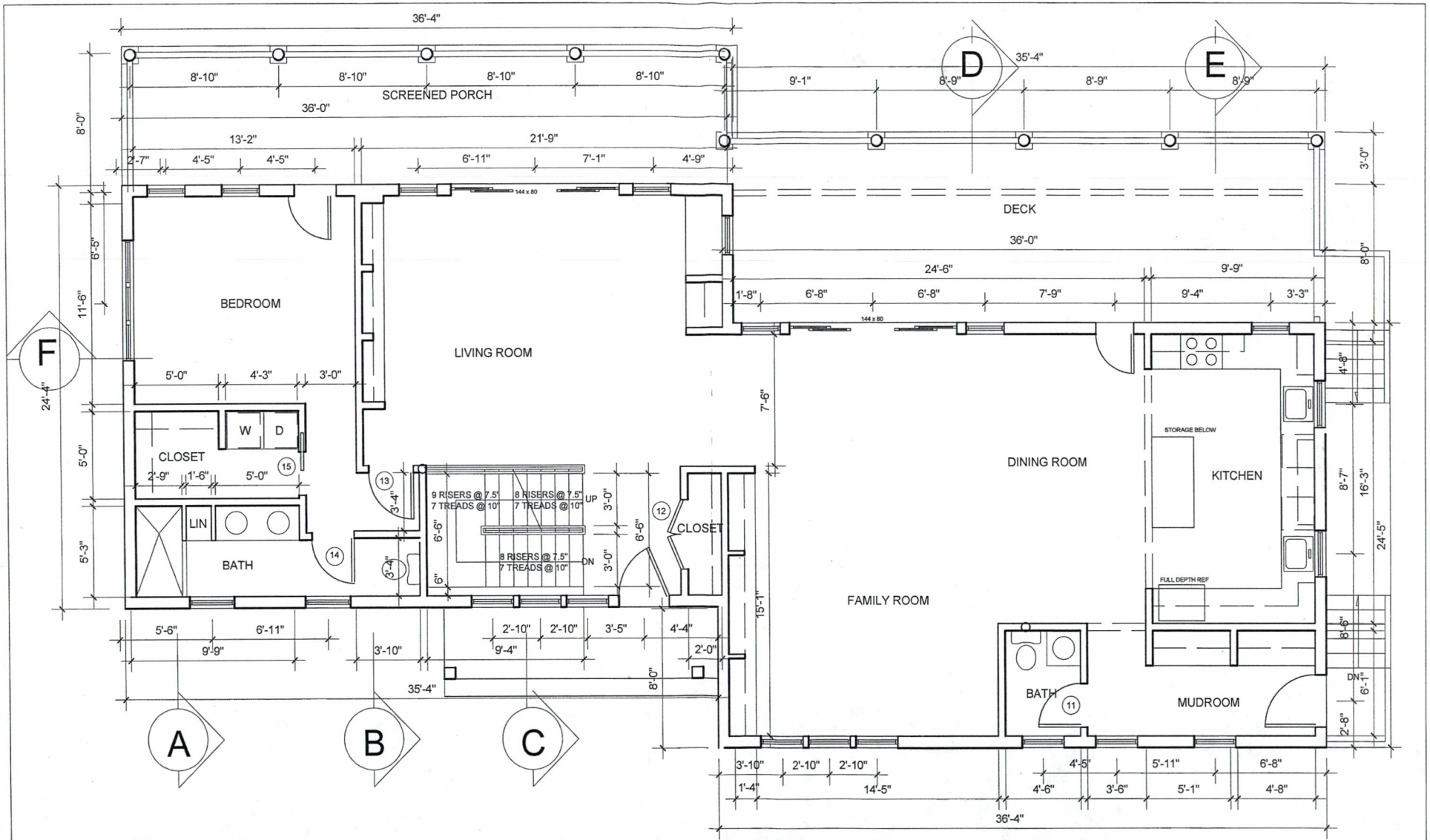
FLOOR PLAN SKETCH

21 Deacon's Folly Road, Harwich, MA *(ASSR'S. MAP 46, PARCEL X6)*

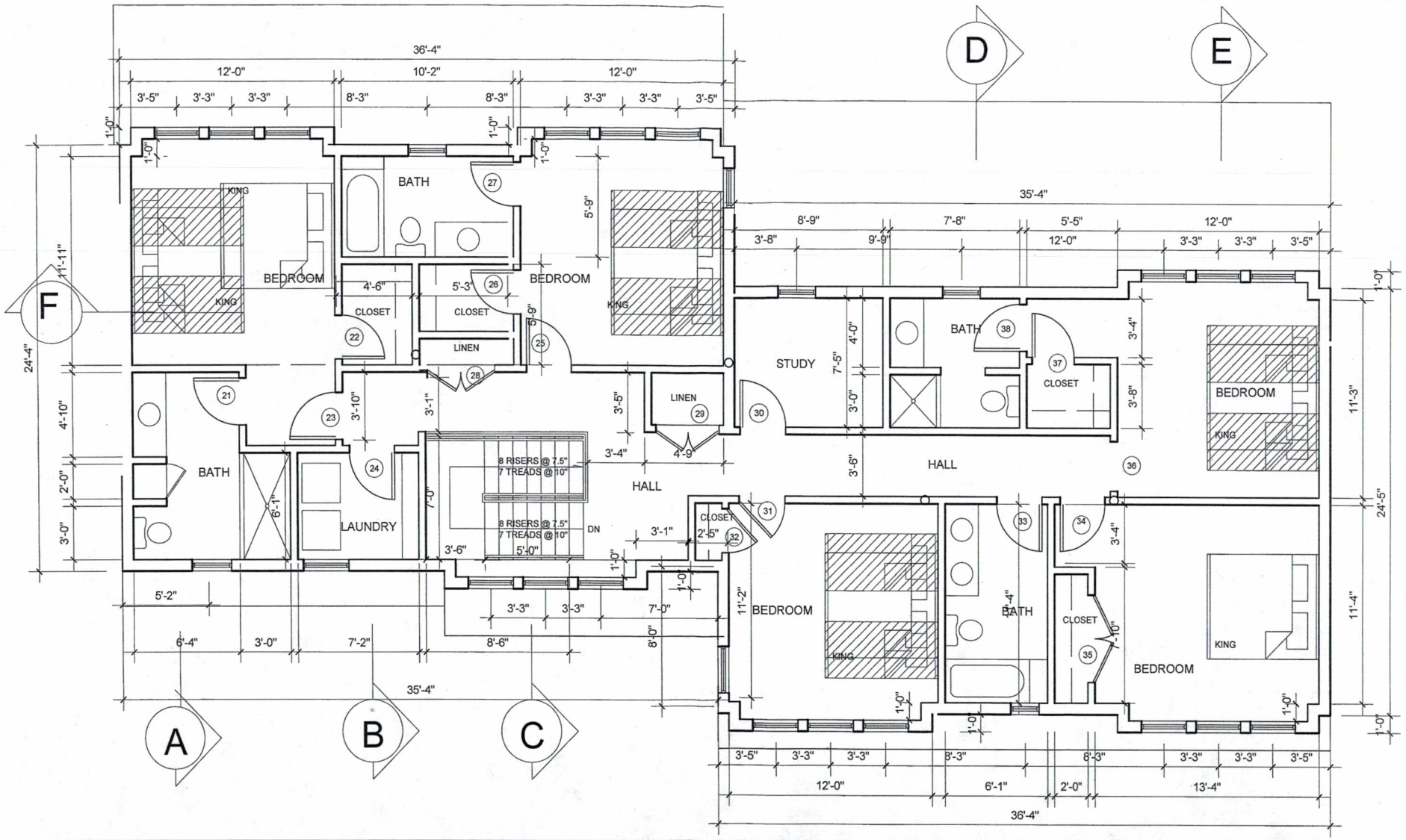
Ryder & Wilcox, Inc., P.E.& P.L.S.
3 Giddiah Hill Rd.
P.O. Box 439
So. Orleans, MA 02662

Scale: 1" = 20'
Date – 3/2/2020

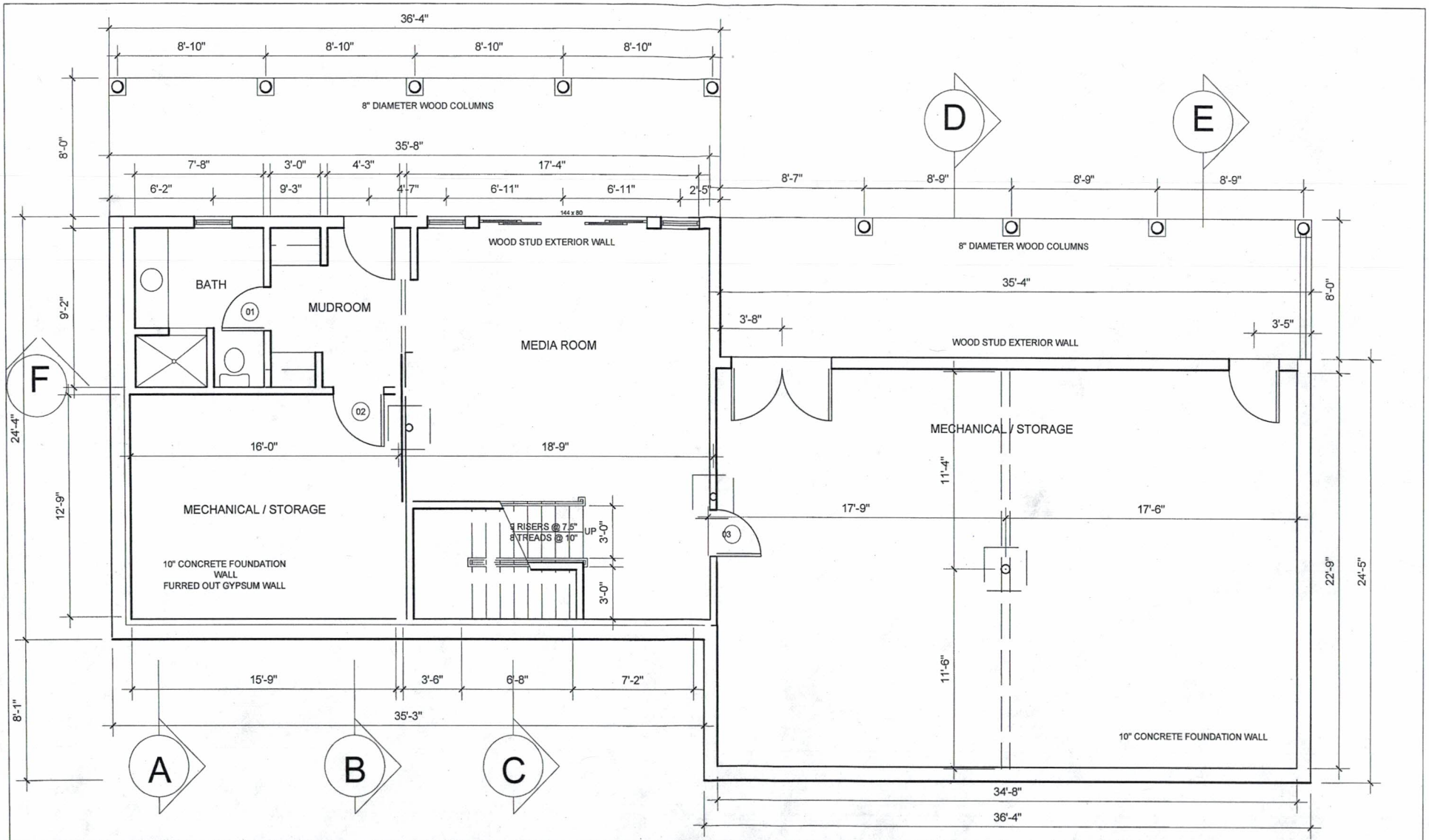
Job No. 4406



TED SMITH Architect, LLC 12 Dartmouth Place . Boston 422 Commercial Street . Provincetown 617 . 247 . 0023 TEDSMITHARCHITECT@GMAIL.COM	PROJECT TITLE 21 DEACONS FOLLY ROAD Harwich, Massachusetts	DRAWING TITLE FIRST FLOOR PLAN	SCALE 3/16 = 1'-0" DATE 24 FEBRUARY 2020	SHEET NO. A1.1

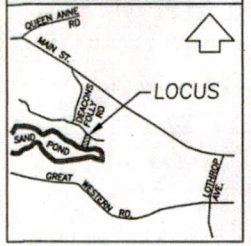


TED SMITH Architect, LLC 12 Dartmouth Place . Boston 422 Commercial Street . Provincetown 617 . 247 . 0023 TEDSMITHARCHITECT@GMAIL.COM	PROJECT TITLE 21 DEACONS FOLLY ROAD Harwich, Massachusetts	DRAWING TITLE SECOND FLOOR PLAN	SCALE 3/16 = 1'-0" DATE 24 FEBRUARY 2020	SHEET NO. A1.2



TED SMITH Architect, LLC 12 Dartmouth Place . Boston 422 Commercial Street . Provincetown 617 . 247 . 0023 TEDSMITHARCHITECT@GMAIL.COM	PROJECT TITLE 21 DEACONS FOLLY ROAD Harwich, Massachusetts	DRAWING TITLE BASEMENT PLAN	SCALE 3/16 = 1'-0" DATE 24 FEBRUARY 2020	SHEET NO. A1.0

LOCATION MAP
Not to Scale



ASSR'S. MAP 46, PARCEL X6
PL. BK. 148, PG. 27
PROPERTY IS NOT LOCATED WITHIN A ZONE II

GENERAL NOTES:

1. SYSTEM IS DESIGNED IN ACCORDANCE WITH "COMMONWEALTH OF MASS., DEPT. OF ENVIRONMENTAL PROTECTION, 310 CMR 15.00; THE STATE ENVIRONMENTAL CODE, TITLE 5: STANDARD REQUIREMENTS FOR THE SITING, CONSTRUCTION, INSPECTION, UPGRADE AND EXPANSION OF ON-SITE SEWAGE TREATMENT AND DISPOSAL SYSTEMS" AND THE TOWN OF HARWICH REGULATIONS, EXCEPT AS NOTED UNDER VARIANCE REQUEST.
2. NO WELLS OR WATER SUPPLIES ARE KNOWN TO EXIST WITHIN 100 FEET OF THE PROPOSED SOIL ABSORPTION SYSTEM. ALL WELLS KNOWN TO EXIST WITHIN 150 FT. OF THE SYSTEM ARE SHOWN.
3. PRIOR TO BACKFILLING COMPLETED SYSTEM, NOTIFY THE ENGINEER AND THE HEALTH DEPARTMENT FOR INSPECTION. PROVIDE 24 HOURS (MIN.) NOTICE.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
5. ANY CHANGES TO THIS PLAN MUST BE APPROVED BY THE BOARD OF HEALTH.
6. AREA SERVED BY TOWN WATER.

CONSTRUCTION NOTES:

1. DRIVEWAY TO BE CONSTRUCTED OF PERMEABLE MATERIAL.
2. LIMITS OF CONSTRUCTION AND/OR GRADING TO BE AS SHOWN ON PLAN AND SHALL BE VISIBLY MARKED, PRIOR TO, AND DURING CONSTRUCTION.
3. FABRIC SILTFENCE TO BE SECURELY STAKED IN PLACE PRIOR TO CONSTRUCTION AND SHALL REMAIN IN PLACE UNTIL DISTURBED AREAS HAVE BEEN REVEGETATED.
4. DISTURBED AREAS SHALL BE STABILIZED AND REVEGETATED AS SOON AS PRACTICABLE UPON COMPLETION OF GRADING.
5. ALL EXCESS EXCAVATED MATERIAL SHALL BE STOCKPILED OUTSIDE THE 100' BUFFER ZONE AND SHALL BE REMOVED FROM THE SITE UPON COMPLETION OF CONSTRUCTION.
6. GUTTERS AND DOWNSPOUTS CONNECTED TO DRYWELLS, OR CRUSHED STONE @ ROOF DRIPLINE, TO BE UTILIZED TO CONTAIN ROOF RUN-OFF.
7. ANY ADDITIONAL WORK BEYOND THE SCOPE OF THAT WHICH IS SHOWN HEREON, AND WHICH IS WITHIN 100' OF THE WETLAND, WILL REQUIRE CONSERVATION COMMISSION APPROVAL.

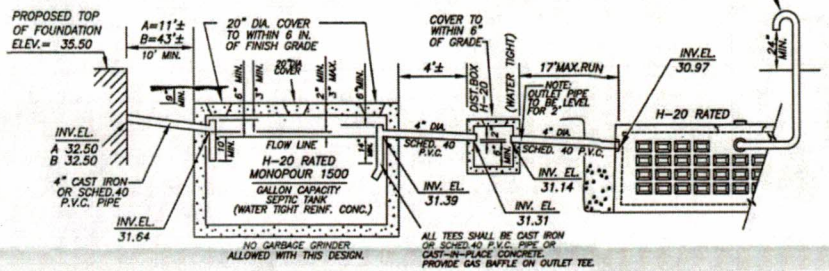
TYPICAL SYSTEM PROFILE
NOT TO SCALE

ALL COVERS AND INSPECTION PORTS SHALL BE MARKED WITH MAGNETIC MARKING TAPE OR A COMPARABLE MEANS IN ORDER TO LOCATE THEM ONCE BURIED.

TANK & D.BOX TO BE INSTALLED ON A LEVEL, STABLE BASE (MIN.6" STONE BASE)

MAINTAIN A MAXIMUM OF 36"COVER OVER ALL SYSTEM COMPONENTS. ALL COMPONENTS SHALL CONFORM TO SPECIFICATIONS CONTAINED IN 310 CMR 15.00.

VENT-4" PVC WITH SCREEN; BACKFILL TIGHTLY TO PREVENT SEEPAGE OF SURFACE WATER.

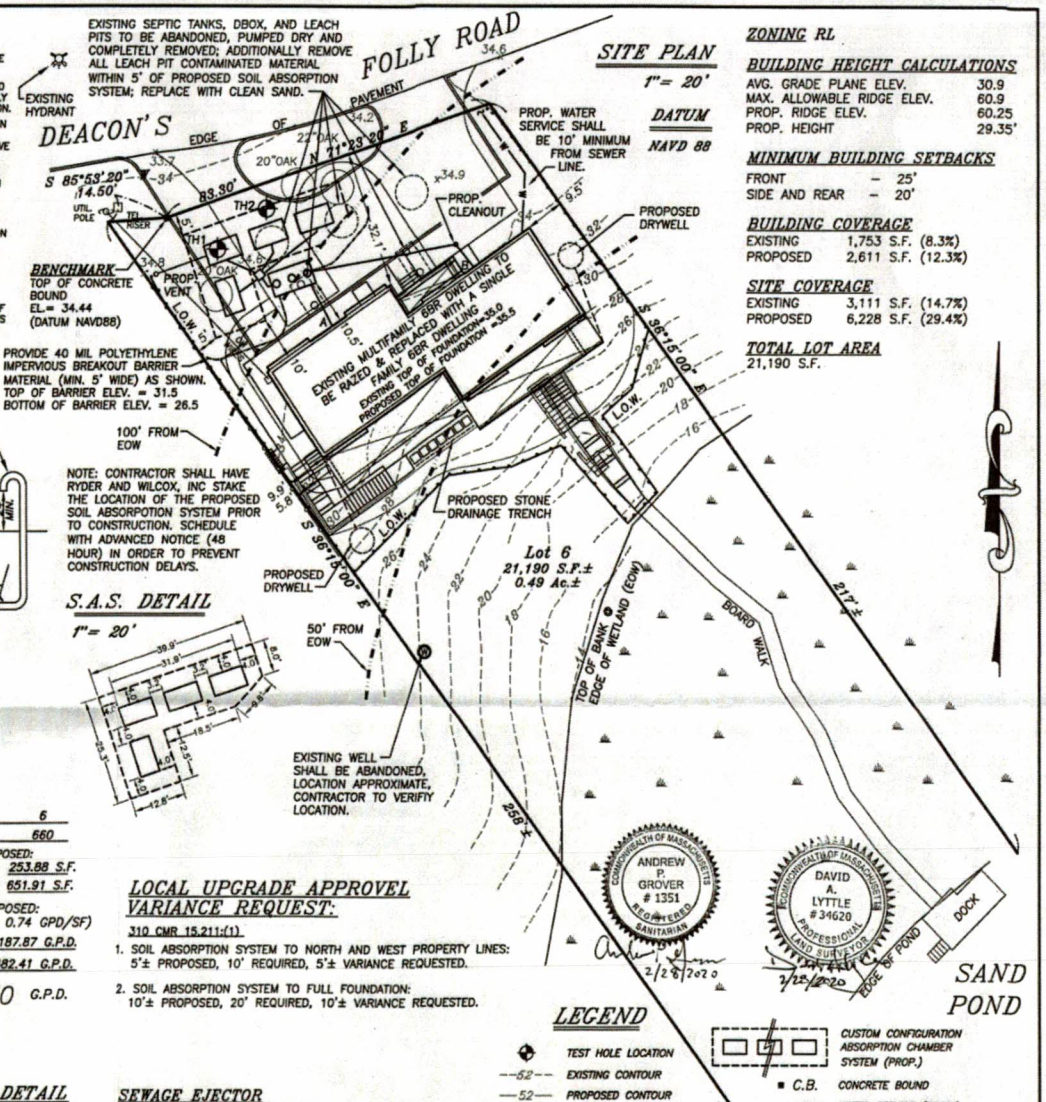


EXISTING SEPTIC TANKS, DBOX, AND LEACH PITS TO BE ABANDONED, PUMPED DRY AND COMPLETELY REMOVED; ADDITIONALLY REMOVE ALL LEACH PIT CONTAMINATED MATERIAL WITHIN 5' OF PROPOSED SOIL ABSORPTION SYSTEM; REPLACE WITH CLEAN SAND.

EXISTING HYDRANT

SITE PLAN
1"= 20'

DATUM
NAVD 88



S.A.S. DETAIL
1"= 20'

ZONING RL

BUILDING HEIGHT CALCULATIONS

AVG. GRADE PLANE ELEV.	30.9
MAX. ALLOWABLE RIDGE ELEV.	60.9
PROP. RIDGE ELEV.	60.25
PROP. HEIGHT	29.35'

MINIMUM BUILDING SETBACKS

FRONT	– 25'
SIDE AND REAR	– 20'

BUILDING COVERAGE

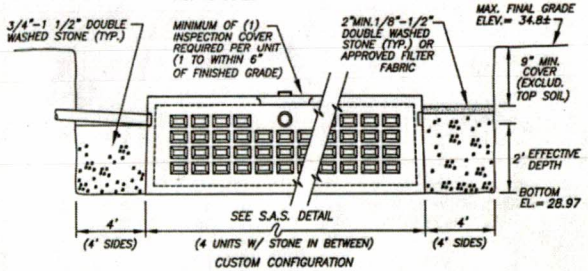
EXISTING	1,753 S.F. (8.3%)
PROPOSED	2,611 S.F. (12.3%)

SITE COVERAGE

EXISTING	3,111 S.F. (14.7%)
PROPOSED	6,228 S.F. (29.4%)

TOTAL LOT AREA
21,190 S.F.

ABSORPTION CHAMBER DETAIL (H-20)
(500-GAL."ACME PRECAST" UNITS H-20 RATED, OR EQUAL)
NOT TO SCALE



CUSTOM CONFIGURATION

DESIGN DATA

NUMBER OF BEDROOMS: 6
ESTIMATED DAILY EFFLUENT: 660
TOTAL LEACHING AREA AS PROPOSED:
SIDEWALL: 2(L+W) x D = 253.88 S.F.
BOTTOM: L x W = 651.91 S.F.
LEACHING CAPACITY AS PROPOSED:
(EFFLUENT LOADING RATE = 0.74 GPD/SF)
SIDEWALL: 253.88 x 0.74 = 187.87 G.P.D.
BOTTOM: 651.91 x 0.74 = 482.41 G.P.D.

TOTAL = 670 G.P.D.

LOCAL UPGRADE APPROVAL VARIANCE REQUEST:

310 CMR 15.211:(1)

1. SOIL ABSORPTION SYSTEM TO NORTH AND WEST PROPERTY LINES: 5'± PROPOSED, 10' REQUIRED, 5'± VARIANCE REQUESTED.
2. SOIL ABSORPTION SYSTEM TO FULL FOUNDATION: 10'± PROPOSED, 20' REQUIRED, 10'± VARIANCE REQUESTED.

ANDREW P. GROVER # 1351 REGISTERED SANITARIAN
COMMONWEALTH OF MASSACHUSETTS
2/28/2020

DAVID A. LYTTLE #34620 PROFESSIONAL LAND SURVEYOR
COMMONWEALTH OF MASSACHUSETTS
2/28/2020

LEGEND

- TEST HOLE LOCATION
- 52 EXISTING CONTOUR
- 52 PROPOSED CONTOUR
- SEPTIC TANK (PROP.)
- DISTRIBUTION BOX (PROP.)
- CUSTOM CONFIGURATION ABSORPTION CHAMBER SYSTEM (PROP.)
- C.B. CONCRETE BOUND
- W WATER SERVICE (PROP.)
- HYDRANT (EXIST.)
- 34.8 SPOT GRADE (EXIST.)

TEST HOLE DATA

DATE OF TEST HOLES: 9/11/2019
NO WATER ENCOUNTERED
INSP. BY: D. QUINN (R&W), K. TENAGLIA (HEALTH DEPT)

No.1

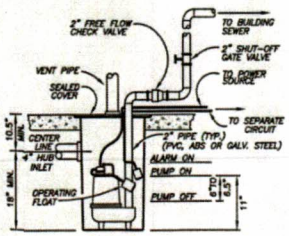
DEPTH (IN.)	SOIL HORIZON	SOIL TEXTURE	ELEVATION (FT.)
0 – 3	O	FIBRIC	34.6 – 34.4
3 – 7	E	MEDIUM SAND	34.4 – 34.0
7 – 12	A	LOAMY SAND	34.0 – 33.6
12 – 28	B	LOAMY SAND	33.6 – 32.3
28 – 132	C	MEDIUM TO COARSE SAND	32.3 – 23.6

TOP OF PERC AT 34" (C-LAYER) <2MIN./IN.

No.2

DEPTH (IN.)	SOIL HORIZON	SOIL TEXTURE	ELEVATION (FT.)
0 – 10	FILL		34.7 – 33.9
10 – 30	B	LOAMY SAND	33.9 – 32.2
30 – 132	C	MEDIUM TO COARSE SAND	32.2 – 23.7

SEWAGE EJECTOR DETAIL



SEWAGE EJECTOR PUMP SPECIFICATIONS:

1. SEWAGE EJECTOR SHALL SERVE BASEMENT BATHROOM ONLY. NO OTHER PLUMBING SHALL UTILIZE SEWAGE EJECTOR. ALL OTHER PLUMBING SHALL BE GRAVITY FLOW TO THE BUILDING SEWER OUTLETS. SEWAGE EJECTOR SHALL CONNECT TO BUILDING SEWER OUTLET AND DISCHARGE BY GRAVITY FROM THERE.
2. THE VOLUME OF SEWAGE TO BE PUMPED SHALL BE LESS THAN 25% OF THE DESIGN FLOW. THE SPECIFICATIONS OF THIS DESIGN MEET THE REQUIREMENTS OF 310 CMR: 15.229: PUMPING TO SEPTIC TANKS (1).
3. PUMP SHALL BE MYERS SRM4A OR APPROVED EQUAL AND SHALL BE CAPABLE OF PASSING AT LEAST 2" SOLIDS.
4. PUMP SHALL BE INSTALLED IN SUMP BASIN IN STRICT CONFORMANCE WITH MANUFACTURER'S SPECIFICATIONS.
5. PUMP CONTROLS SHALL BE MOISTURE PROOF AND OPERATE IN THE FOLLOWING SEQUENCE:
   a) PUMP OFF b) PUMP ON c) ALARM ON
6. PUMP SHALL BE EQUIPPED WITH AN ALARM POWERED BY A CIRCUIT SEPARATE FROM THE PUMP POWER (MYERS TA-10).
7. CHECK VALVE, SUMP BASIN, AUTOMATIC CONTROL AND CONTROL BOX SHALL BE AS SPECIFIED BY PUMP MANUFACTURER, OR APPROVED EQUAL.
8. SUMP BASIN SHALL HAVE A GAS TIGHT COVER AND VENT PIPE.

PROPOSED DWELLING & ON-SITE SEWAGE TREATMENT AND DISPOSAL SYSTEM

Prepared for: The Deacon's Folly Realty Trust
Location: 21 Deacon's Folly Road, Harwich, MA

Ryder & Wilcox, Inc., P.E.& P.L.S.
3 Giddiah Hill Rd.
P.O. Box 439
So. Orleans, MA.,02662
Tel.(508) 255-8312
Fax.(508) 240-2306

Scale: 1"=20'
Drawn by APC
Date – 11/25/2019

Revised 1/16/2020
Revised 1/29/2020
Revised 2/6/2020
Revised 2/28/2020 (Septic details)

Job No. 12343

V-B.

MARCH 17, 2020
BOARD OF HEALTH MEETING

To: Board of Health
From: Meggan Eldredge, Health Director
Applicant: Brian C. Paterson, Tr.
Address: 15 Pine Wood Lane

On behalf of the owner, Stephanie J. Sequin of Ryder & Wilcox, Inc. is applying for a variance from Title 5, Section 310 CMR 15.211(1) as follows:

Variance from 310 CMR 15.211: Minimum Setbacks

1. Per 310 CMR 15.211(1): To allow a proposed soil absorption system to be 15' from the cellar wall where 20' is required. Variance request of 5'.

The variance is requested to allow for the installation of a sewage disposal system to serve an existing two-bedroom dwelling. There are no additions or alterations to the property proposed at this time. The existing system, which consists of two cesspools, is to be abandoned. Due to limited space between the existing building and the property line, it is not possible to design a system in full compliance with Title 5 and the Board of Health Regulations. This plan does not require approval from the Conservation Commission.

This is an existing 2 bedroom dwelling and the upgraded septic system is designed accordingly and is a great improvement over the current cesspools.

I recommend approval of the variances with the following conditions:

1. The dwelling be restricted to two bedrooms.
2. No increase in habitable space or square footage without further review by the Board of Health.
3. Variances to be recorded at the Registry of Deeds.

Office Use Only
Filing Fee Paid/Amount: _____
Check #/Cash: _____
Date App Received: _____
Meeting Date: _____
Date Approved: _____
Date Denied: _____
Reason for Denial:
_____
_____

Town of Harwich
Board of Health

732 Main Street Harwich, MA 02645
508-430-7509 – Fax 508-430-7531
E-mail: health@town.harwich.ma.us

Application for Board of Health Variances

Date: 3/3/20

Property Address: 15 Pine Wood Lane, Harwich

Map: 4 Parcel: T1-28B

Book: _____ Page: _____ Land Court No: 213410 (LCP 12465-C, Lot 28B)

Name of Applicant: Brian C. Paterson, Tr.

Applicant Mailing Address: 9 Hallview Drive

Simsbury CT 06070

City State Zip Code

Applicant Telephone Number: 860.508.8118

Applicant E-Mail Address: briancpaterson@yahoo.com

Owner(s) of Record: Brian C. Paterson, Tr. of the Brian C. Paterson Declaration of Trust

Owner(s) Mailing Address: SAA

_____

City State Zip Code

Design Engineer/Sanitarian: Stephanie J. Sequin, P.E.

Firm/Company Name: Ryder & Wilcox, Inc.

Mailing Address: P.O. Box 439

S. Orleans MA 02662

City State Zip Code

Telephone Number: 508.255.8312

Design Engineer/Sanitarian E-Mail Address: Stephanie@ryder-wilcox.com

Please Choose Application Type:

Voluntary Upgrade: X Addition/Alteration: ____ Failed System: ____ EIR: ____
Other: _____

Conservation Commission Approval Required: No: X Yes: ___ Date of CC Hearing: _____

List All Variances from State & Local Codes

Title 5, Section #	**Description of Variance(s):**
310 CMR 15.211	The proposed soil absorption system shall be approximately 15' from the existing cellar
Min. Setback Distance	wall (5' variance required)
Harwich Reg. #	**Description of Variance(s):**

In addition to this form, 8 packets of the following must be submitted by 4:00 p.m. on the filing deadline date:

- ☐ Letter to Board of Health
- ☐ Letter to abutters (bring certified mail receipts to the meeting)
- ☐ Copy of certified abutter list
- ☐ Existing variance letter (if applicable)
- ☐ Floor plans (all floors/existing & proposed)
- ☐ Site plan
- ☐ Filing Fee $125.00 (Variance)/$300.00 (EIR)

Ryder & Wilcox
SURVEYING · ENGINEERING
HOME PLANNING & DESIGN

3 GIDDIAH HILL ROAD · P.O. BOX 439
SO. ORLEANS, MASSACHUSETTS 02662-0439
TEL: 508.255.8312 FAX: 508.240.2306
EMAIL: info@ryder-wilcox.com

March 3, 2020

Town of Harwich Board of Health
732 Main Street
Harwich, MA 02645

RE: 15 Pine Wood Lane (Map 4, Parcel T1-28B)

Dear Board Members,

On behalf of our client, Brian Paterson, please schedule a hearing to consider a request for a variance from the State Environmental Code, Title 5, and the Harwich Board of Health Regulations. The variance is requested to allow the installation of a sewage disposal system to serve an existing two-bedroom dwelling. The existing system, which consists of two cesspools, is to be abandoned.

The property is a 6,232 SF developed site. According to Assessor's records, the existing two-bedroom home was constructed in 1961. Mr. Paterson's parents purchased the home in 1976. Mrs. Paterson passed away in 2015 and the property was transferred to Brian Paterson and his siblings. Although an upgrade is not required, the family feels it is prudent to replace the cesspools with a Title 5 system.

Due to limited space between the existing building and the property line, it is not possible to design a system in full compliance with Title 5 and Board of Health regulations. The proposed sewage disposal system, as shown on the attached plan dated February 14, 2020, complies with all State Title 5 and Harwich Board of Health regulations except the following:

310 CMR 15.211: Minimum Setback Distances
The proposed soil absorption system (SAS) shall be approximately 15' from the existing cellar wall (5' variance required)

It should be noted that soil testing in the vicinity of the proposed SAS shows clean sand with no water encountered to 11' deep. There are no wetlands within 300' of the property.

I have included 8 sets of the proposed On-Site Sewage Treatment & Disposal System Plan, Existing floor plans, the Abutter Notification letter, a Certified list of abutters, and a check for $125.00.

Thank you for your consideration in this matter.

Sincerely,

Stephanie J. Sequin

Stephanie J. Sequin, P.E.
cc: Paterson
R&W #11614

ARWICH ASSESSORS SHEET 4

Ryder & Wilcox
SURVEYING · ENGINEERING
HOME PLANNING & DESIGN

3 GIDDIAH HILL ROAD · P.O. BOX 439
SO. ORLEANS, MASSACHUSETTS 02662-0439
TEL: 508.255.8312 FAX: 508.240.2306
EMAIL: info@ryder-wilcox.com

March 3, 2020

Re: 15 Pine Wood Lane (Map 4, Parcel T1-28B)

Dear Abutter:

You are being notified pursuant to the State Environmental Code, Title 5, and the Harwich Board of Health Regulations that the Board of Health will hold a public hearing to consider a request for a variance from applicable State and Local Regulations. The variance will allow installation of a new sewage disposal system to serve the existing dwelling at 15 Pine Wood Lane.

A copy of the letter requesting a hearing is enclosed. Copies of a Site Plan are on file with the Board of Health and may be viewed prior to the public hearing to be held on March 17, 2020 in Town Hall, 732 Main Street. Hearings begin at 7:00 P.M.

Sincerely,

Stephanie J. Sequin

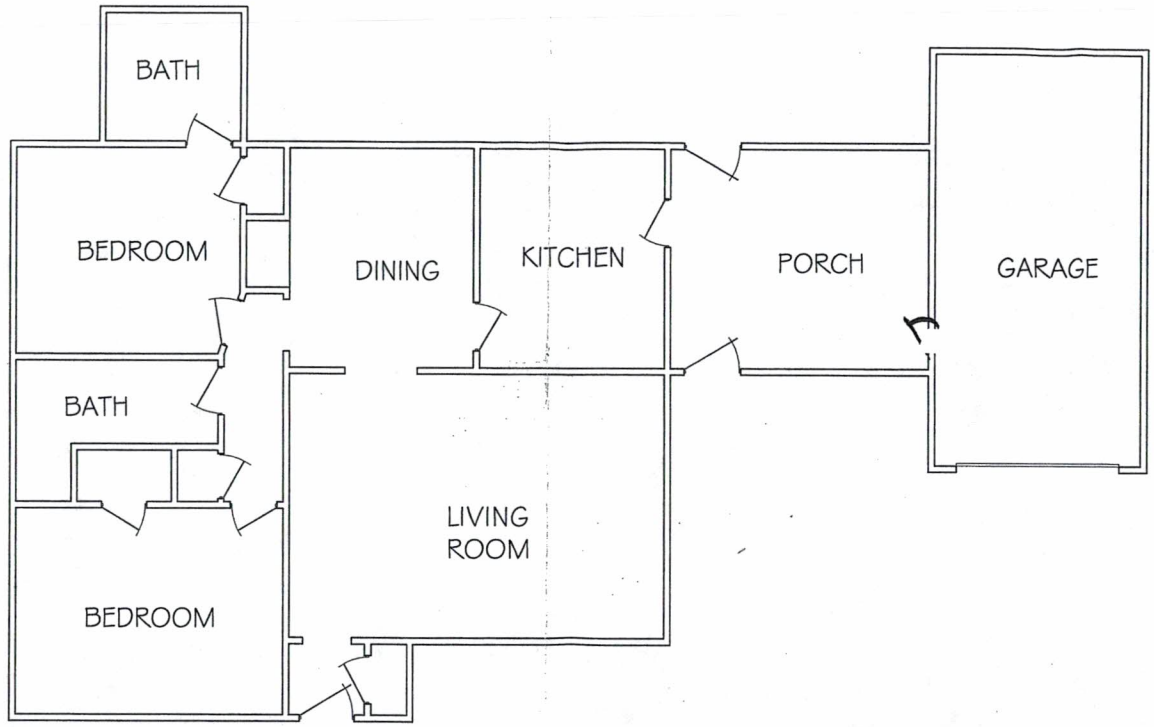
Stephanie J. Sequin, P.E.

cc: Paterson
R&W #11614

TOWN OF HARWICH, MA
BOARD OF ASSESSORS
732 Main Street, Harwich, MA 02645

Abutters List Within 100 feet of Parcel 4/T1-28B/0

Key	Parcel ID	Owner	Location	Mailing Street	Mailing City	ST	ZipCd/Country
8131	4-S2-A5-0-R	DIMATTEO ANDREW R & DIMATTEO DEBORAH B	8 PINE WOOD LN	290 BRIDLE TRAIL RD	NEEDHAM	MA	02492
656	4-S2-A3-4-0-R	ELIAS GERARD L TRS ET AL ELIAS MARIA P TRS	16 PINE WOOD LN	16 PINE WOOD LN	W HARWICH	MA	02671
8132	4-S2-A3-5-0-R	MARENGI ANNE F TR A F MARENGI REALTY TRUST	12 PINE WOOD LN	63 COUNTY ST	PEABODY	MA	01960
714	4-T1-24-0-R	APPLEBAUM MATTHEW S & APPLEBAUM NICOLE M	16 PINE NEEDLE LN	11 CEDAR FARMS RD	MEDWAY	MA	02053
718	4-T1-25-0-R	ONEILL GAIL ET AL TOTH PATRICIA A	12 PINE NEEDLE LN	26 MORNINGSIDE DR	GREENWICH	CT	06830
727	4-T1-29-0-R	GACEK RICHARD	19 PINE WOOD LN	2481 RIVER RD	NEW HOPE	PA	18938
723	4-T1-28A-0-R	BILOTTA STEVEN A TRS ET AL BILOTTA KATHLEEN J TRS	13 PINE WOOD LN	13 PINE WOOD LN	W HARWICH	MA	02671
726	4-T1-28B-0-R	PATERSON BRIAN C TR BRIAN C PATERSON DEC OF TRUST Locus	15 PINE WOOD LN	9 HALLVIEW DR	SIMSBURY	CT	06070



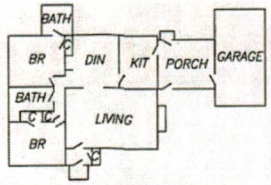
EXISTING FLOOR PLAN AT #15 PINE WOOD LANE HARWICH, MA

Ryder & Wilcox
SURVEYING ENGINEERING
HOME PLANNING & DESIGN
3 GIDDIAH HILL ROAD P.O. BOX 439
SO. ORLEANS, MASSACHUSETTS 02662

EXISTING FLOOR PLAN SKETCH FOR:
BRIAN PATERSON

IN: HARWICH, MA
SCALE: NTS
DRAWN BY: DLQ
DATE: 12/9/15
REVISED:
ON: #15 PINE WOOD LANE.
JOB #: 11614
ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM TO THE MASSACHUSETTS STATE BUILDING CODE.ABSENCE OF
DRAWING NUMBER:

A VARIANCE IS REQUIRED TO ALLOW THE PROPOSED SOIL ABSORPTION SYSTEM TO BE APPROXIMATELY 15 FEET FROM A CELLAR WALL (CRAWLSPACE). (5' VARIANCE FROM 310 CMR 15.211(1))



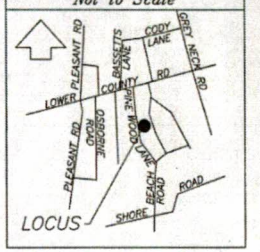
EXISTING DWELLING

GENERAL NOTES:

1. SYSTEM IS DESIGNED IN ACCORDANCE WITH "COMMONWEALTH OF MASS., DEPT. OF ENVIRONMENTAL PROTECTION, 310 CMR 15.00; THE STATE ENVIRONMENTAL CODE, TITLE 5: STANDARD REQUIREMENTS FOR THE SITING, CONSTRUCTION, INSPECTION, UPGRADE AND EXPANSION OF ON-SITE SEWAGE TREATMENT AND DISPOSAL SYSTEMS" AND THE TOWN OF HARWICH REGULATIONS, EXCEPT AS NOTED.
2. NO WELLS OR WATER SUPPLIES ARE KNOWN TO EXIST WITHIN 100 FEET OF THE PROPOSED SOIL ABSORPTION SYSTEM. ALL WELLS KNOWN TO EXIST WITHIN 150 FT. OF THE SYSTEM ARE SHOWN.
3. PRIOR TO BACKFILLING COMPLETED SYSTEM, NOTIFY THE ENGINEER AND THE HEALTH DEPARTMENT FOR INSPECTION. PROVIDE 24 HOURS (MIN.) NOTICE.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
5. ANY CHANGES TO THIS PLAN MUST BE APPROVED BY THE BOARD OF HEALTH.
6. AREA SERVED BY TOWN WATER.
7. DUE TO LIMITED LOT AREA THE PROPOSED SOIL ABSORPTION SYSTEM IS LOCATED UNDER THE EXISTING DRIVEWAY, AS SUCH IT SHALL BE VENTED AND H-20 RATED.
8. NO RESERVE AREA IS PROVIDED. A REPLACEMENT SOIL ABSORPTION SYSTEM, IF NECESSARY, SHALL BE CONSTRUCTED IN PLACE. (REFERENCE DEP'S POLICY DATED 1/3/96)

LOCATION MAP

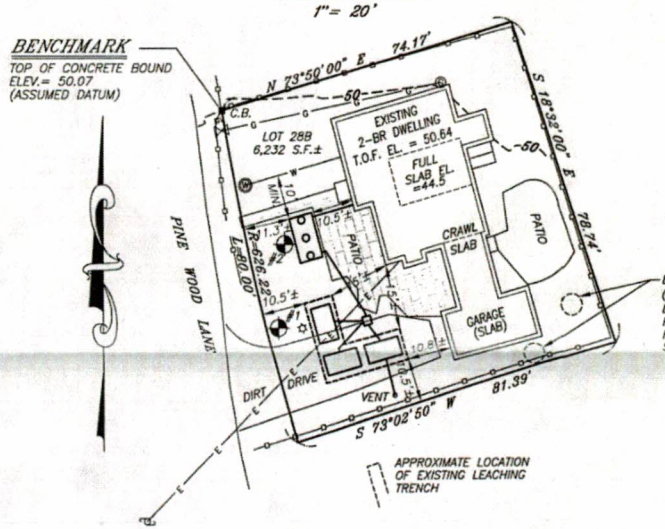
Not to Scale



ASSR'S. MAP 4, PARCEL T1-28B
LCP 12465C

SITE PLAN

1"= 20'



TYPICAL SYSTEM PROFILE

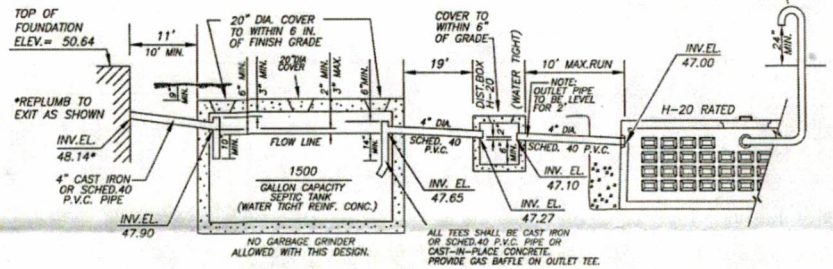
NOT TO SCALE

ALL COVERS AND INSPECTION PORTS SHALL BE MARKED WITH MAGNETIC MARKING TAPE OR A COMPARABLE MEANS IN ORDER TO LOCATE THEM ONCE BURIED.

TANK & D.BOX TO BE INSTALLED ON A LEVEL, STABLE BASE (MIN.6" STONE BASE)

MAINTAIN A MAXIMUM OF 36"COVER OVER ALL SYSTEM COMPONENTS. ALL COMPONENTS SHALL CONFORM TO SPECIFICATIONS CONTAINED IN 310 CMR 15.00.

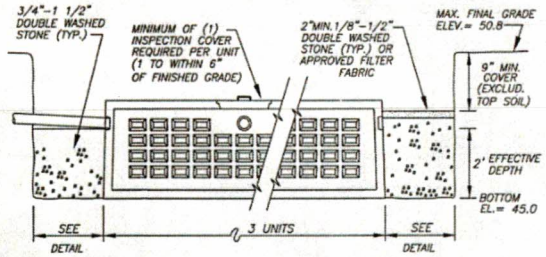
VENT-4" PVC WITH SCREEN; BACKFILL TIGHTLY TO PREVENT SEEPAGE OF SURFACE WATER.

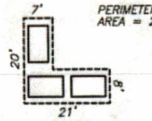


ABSORPTION CHAMBER DETAIL (H-20)

(500-GAL."ACME PRECAST" UNITS H-20 RATED, OR EQUAL)

NOT TO SCALE





PERIMETER = 82 SF
AREA = 252 SF

DETAIL
SOIL ABSORPTION SYSTEM

DESIGN DATA

NUMBER OF BEDROOMS: 2
ESTIMATED DAILY EFFLUENT: 220 GPD
TOTAL LEACHING AREA AS PROPOSED:
SIDEWALL: 2 X PERIMETER = 164 S.F.
BOTTOM: 252 S.F.
LEACHING CAPACITY AS PROPOSED:
(EFFLUENT LOADING RATE = 0.74 GPD/SF)
SIDEWALL: 164 X 0.74 = 121.4 G.P.D.
BOTTOM: 252 X 0.74 = 186.5 G.P.D.

TOTAL = 308* G.P.D.

*A DEED RESTRICTION LIMITING THE PROPERTY SHALL BE RECORDED AT THE REGISTRY OF DEEDS

TEST HOLE DATA

DATE OF TEST HOLES: 12/9/15
NO WATER ENCOUNTERED
INSP. BY: D. QUINN (R&W), M. TIERNEY (HEALTH DEPT)

No.1

DEPTH (IN.)	SOIL HORIZON	SOIL TEXTURE	ELEVATION (FT.)
0 - 12	FILL		50.6 - 49.6
12 - 15	A	LOAMY SAND	49.6 - 49.4
15 - 21	E	MEDIUM SAND	49.4 - 48.9
21 - 35	B	LOAMY SAND	48.9 - 47.7
35 - 132	C	MEDIUM-FINE SAND	47.7 - 39.6

No.2

DEPTH (IN.)	SOIL HORIZON	SOIL TEXTURE	ELEVATION (FT.)
0 - 16	FILL		50.6 - 49.3
16 - 25	B1	LOAMY SAND	49.3 - 48.5
25 - 32	B2	LOAMY SAND	48.5 - 47.9
32 - 132	C	MEDIUM-FINE SAND	47.9 - 39.6

BOTTOM OF PERC AT 56" (C-LAYER) <2MIN./IN.

LEGEND

- TEST HOLE LOCATION
- --52-- EXISTING CONTOUR
- —52— PROPOSED CONTOUR
- SEPTIC TANK
- DISTRIBUTION BOX (H20)
- ABSORPTION CHAMBER SYSTEM (H20)
- C.B. CONCRETE BOUND
- —W— WATER SERVICE (EXISTING)
- —G— GAS SERVICE (EXISTING)
- —E— UNDERGROUND ELECTRIC (EXISTING)

PROPOSED ON-SITE SEWAGE TREATMENT AND DISPOSAL SYSTEM

Prepared for: BRIAN PATERSON
Location: 15 PINE WOOD LANE - HARWICH, MA

Ryder & Wilcox, Inc., P.E.& P.L.S.
3 Ciddiah Hill Rd.
P.O. Box 439
So. Orleans, MA.,02662
Tel.(508) 255-8312
Fax.(508) 240-2306
ryder-wilcox.com

Scale:- 1" = 20'
Drawn by - SJS
Date - February 14, 2020

COMMONWEALTH OF MASSACHUSETTS
STEPHANIE J SEGUIN
CIVIL
No. 37213
REGISTERED PROFESSIONAL ENGINEER

2/14/20

Job No. 11614

V-C.

MARCH 17, 2020
BOARD OF HEALTH MEETING

To:	Board of Health
From:	Meggan Eldredge, Health Director
Applicant:	Clark Engineering
Owner:	Eastward Home Business Trust
Address:	3, 7, 15 & 16 Bascom Hollow

Eastward Companies, care of David Clark P.E., is submitting a revised Environmental Impact Review (originally approved on May 14, 2018) in accordance with Harwich Board of Health Regulation 1.211 for Bascom Hollow. Based on the town's schedule for the installation of municipal sewer in 2018, they proposed and requested to limit the development to 4 lots until such time as the connection to the municipal sewer was available. The applicant understood that they would be able to hook up to the sewer line in Route 39/Orleans Road sometime in 2020. They proposed construction of a shared system to serve the 4 lots. The system would consist of a 6,000 gallon two compartment septic tank, distribution box and a 1,824 gallon per day soil absorption system located on Lot 1. They installed the proposed/approved system with a sewer line in Bascom Hollow to serve all houses once the sewer is up and running. They have completed 3 houses on lots 3, 5 & 7 in 2019 and they are now occupied. The applicant now understands that the sewer line installation in this area may not be completed for at least 2 years, and are now being forced to look at an alternative to address the septic issue at hand with the delay in the municipal sewer. The applicant has revised the Environmental Impact Review to propose individual systems on the remaining 4 lots. It is important to note that this property is located in the Pleasant Bay watershed. This area is part of Phase 2 sewering, but is in contract 3, which has not yet had funding approved.

I recommend the Board consider one of the following options:

1. Allow the newly released properties to have traditional systems on their own lots.
2. Require Innovative/Alternative septic systems on only the newly released lots.
3. Require Innovative/Alternative technology on all of the lots.

EASTWARD
COMPANIES

March 4, 2020

Harwich Board of Health
732 Main Street
Harwich, MA 02645

RE: Bascom Hollow – Environmental Impact Review for compliance with Regulation 1.211

Dear Members of the Board:

Eastward Companies is submitting a revised Environmental Impact Review in accordance with Harwich Board of Health Regulation 1.211 for Bascom Hollow to the Board of Health for your review on Tuesday, March 17, 2020.

The Board of Health reviewed and approved the 8-lot Definitive Subdivision Plan on May 14, 2018. According to the attached recorded Certificate of Conformance, the subdivision is:

1. Located in the groundwater protection district (Zone II).
2. Proposed to include 8 homes.
3. Each home will be on a 40,000 s.f. lot.
4. Each home will have 4 bedrooms.
5. There will be a total of 32 bedrooms in the subdivision.

Based on the Town's schedule for the installation of the municipal sewer in 2018, we proposed and requested to limit the development to 4 lots until such time as the connection to the municipal sewer was available. We understood that we'd be able to hook-up to the sewer line in Route 39/Orleans Road sometime in 2020. We proposed construction of a shared septic system to serve the 4 lots. The system would consist of a 6,000 gallon two compartment septic tank, distribution box, and an 1,824 gallon per day soil absorption system located on "Lot 1". The Board's approval included the 5 conditions as listed on the Certificate of Conformance.

155 Crowell Road • Chatham, MA 02633
(508) 945-2300 • Fax (508) 945-2374 • eastwardco.com

We installed the proposed/approved system with a sewer line in Bascom Hollow to serve all houses once the sewer is up and running. We completed 3 houses on Lots 3, 5, and 7 in 2019 and they are now occupied. We are negotiating with a buyer on the purchase of Lot 6 and designing a house with construction to start this year. We are meeting with prospective buyer this week who is looking at purchasing and building on one of the remaining 4 lots in the subdivision.

We now understand that the sewer line installation in this area may not be completed for at least 2 years. Our agreement in 2018 with the Board of Health was made in a good faith effort that the sewer would be available sometime this year for all the lots in the subdivision. However, we are now forced to look at an alternative to address the septic issue at hand with the delay in the municipal sewer.

We have revised the Environmental Impact Review to propose individual systems on the remaining 4 lots (1, 2, 4, and 8) in accordance with the Board of Health regulations and request the approval of the Board of Health to allow this revision. We are submitting eight (8) copies of the following items for your review on March 17th:

1. Board of Health Application
2. Definitive subdivision plan
3. Recorded Certificate of Conformance
4. 3-4-20 Groundwater Impact Report prepared by Clark Engineering
5. Nitrogen Loading Calculation dated 3-4-20
6. Check for filing fee - $300.00

Please let me know if you need any additional information. We appreciate your consideration of our request and look forward to meeting with you.

Sincerely,

Susan B. Ladue

Susan B. Ladue
Regulatory Specialist

cc: David Clark, P.E.

Office Use Only
Filing Fee Paid/Amount: _____
Check #/Cash: _____
Date App Received: _____
Meeting Date: _____
Date Approved: _____
Date Denied: _____
Reason for Denial:
_____
_____

Town of Harwich
Board of Health

732 Main Street Harwich, MA 02645
508-430-7509 – Fax 508-430-7531
E-mail: health@town.harwich.ma.us

Application for Board of Health Variances

Date: 3-4-20

Property Address: 3, 7, 15, and 16 Bascom Hollow

Map: 97 Parcel: B2-5, B2-6, B2-8, + B2-12

Book: 30775 Page: 86 + 30950/131 Land Court No: _____

Name of Applicant: Eastward Companies

Applicant Mailing Address: 155 Crowell Road

Chatham, MA 02633

City State Zip Code

Applicant Telephone Number: 508-945-2300

Applicant E-Mail Address: sladue@eastwardco.com

Owner(s) of Record: Eastward MBT LLC, Trustee, Eastward Homes Business Trust

Owner(s) Mailing Address: 155 Crowell Road

Chatham, MA 02633

City State Zip Code

Design Engineer/Sanitarian: David Clark, P.E.

Firm/Company Name: Clark Engineering

Mailing Address: 156 Crowell Road

Chatham, MA 02633

City State Zip Code

Telephone Number: 508-945-2300

Design Engineer/Sanitarian E-Mail Address: david@clarkeng.net

Please Choose Application Type:

Voluntary Upgrade: ____ Addition/Alteration: ____ Failed System: ____ EIR: X
Other: _____

Conservation Commission Approval Required: No: X Yes: ___ Date of CC Hearing: _____

List All Variances from State & Local Codes

Title 5, Section #	Description of Variance(s):
Harwich Reg. #	**Description of Variance(s):**
1.211	Environmental Impact Review for Compliance

In addition to this form, 8 packets of the following must be submitted by 4:00 p.m. on the filing deadline date:

- ☑ Letter to Board of Health
- ☐ Letter to abutters (bring certified mail receipts to the meeting)
- ☐ Copy of certified abutter list
- ☐ Existing variance letter (if applicable)
- ☐ Floor plans (all floors/existing & proposed)
- ☑ Site plan
- ☑ Filing Fee $125.00 (Variance)/$300.00 (EIR)

PROPERTY ADDRESS: 1322 (FORMERLY) + 1346 ORLEANS RD. HARWICH, MA

Bk 31370 Ps62 #31303
06-28-2018 @ 09:50a

Town of Harwich
Board of Health
732 Main Street Harwich, MA 02645
508-430-7509 – Fax 508-430-7531
E-mail: health@town.harwich.ma.us

CERTIFICATE OF CONFORMANCE

May 22, 2018

Eastward Homes Business trust
Eastward MBT LLC, Trustee
155 Crowell Road
Chatham, MA 02633

Re: Bascom Hollow-8 Lot Subdivision
Map 97 Parcel B2
Book 30950 Page 131
Environmental Impact Report

To Whom It May Concern:

At a meeting of the Board of Health on May 14, 2018, a hearing was conducted to consider an application for Environmental Impact Review in accordance with Harwich Board of Health Regulation 1.211.The applicant seeks approval for an 8 lot subdivision. This subdivision is located in the groundwater protection district (Zone II) and is proposed to include 8 homes, each on a 40,000 square foot lot with 4 bedrooms per home for a total of 32 bedrooms. The applicant is requesting to limit the development to 4 lots until such time as the connection to the municipal sewer takes place. The proposal is to construct a shared septic system to serve the 4 lots. The system will consist of a 6,000 gallon two compartment septic tank, distribution box and an 1,824 gallon per day soil absorption system located on "Lot 1".

David Clark of Clark Engineering, LLC submitted the following documents for Board of Health consideration:

1. Definitive Division plan dated April 10, 2018 by Clark Engineering, LLC
2. Environmental Impact Report dated April 20, 2018
3. Groundwater Impact Report dated April 20, 2018

After considerable review and discussion it was a decision of the Board to approve the proposal with the following order of conditions:

1. The development is restricted to a maximum of 4 lots, 16 bedrooms, 1760 gallons per day until such time as municipal sewer is available for use.
2. Each lot is restricted to a maximum of 4 bedrooms.
3. In order to prepare for connection to municipal sewer, the waste lines will exit the buildings on the street side.
4. The Harwich Board of Health will not consider any variances from Title 5 of Harwich Board of Health Regulations for any of the lots.
5. The subdivision will be served by town water.

This letter will be required to be recorded at the Barnstable County Registry of Deeds with a copy to be returned to the Harwich Health Department. This shall be completed prior to the issuance of any construction and or septic system permits.

Regards,

Meggan Eldredge

Meggan Eldredge, R.S., C.H.O
Health Director

Signature(s) of Owner and Legal Address

William Marsh Date 6-4-18

WILLIAM MARSH
155 CROWELL ROAD, CHATHAM, MA 02633

COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss.

WILLIAM MARSH 6-4-18
Date

On this 4TH day of JUNE, 2018, the above named appeared before me, the undersigned notary public, and acknowledged the foregoing instrument to be their free act and deed.

Notary Public Susan B. Ladue

My commission expires _____

SUSAN B. LADUE
Notary Public
My Commission Expires
February 4, 2022

SUSAN B. LADUE NOTARY PUBLIC COMMONWEALTH OF MASSACHUSETTS MY COMMISSION EXPIRES FEB. 4, 2022

CC: Clark Engineering LLC, 156 Crowell Road, Chatham, MA 02633
Planning Board

BARNSTABLE REGISTRY OF DEEDS
John F. Meade, Register

GROUNDWATER IMPACT REPORT

BASCOM HOLLOW
RESIDENTIAL SUBDIVISION

HARWICH, MASSACHUSETTS

April 20, 2018
Revised March 4, 2020

PREPARED FOR

EASTWARD HOMES BUSINESS TRUST

PREPARED BY: **DAVID A. CLARK, P.E.**
CLARK ENGINEERING LLC
156 CROWELL ROAD
UNIT B
CHATHAM, MA 02633

T **508-945-5454**
F **508-945-5458**

INTRODUCTION

The subject property is located on the west side of Orleans Road in the eastern part of Harwich between the intersections of Williamsburg Avenue and Huckleberry Path. The Sadies Way subdivision lies to the north of the parcel. No wetland resource areas are located on the property or immediately adjacent to it.

The property is located within the zone of contribution of a municipal well (Massachusetts Department of Environmental Protection Zone II) thus placing it within the Water Resource Protection District. It is also located entirely within the Pleasant Bay Watershed.

The property has a total area 8.5 acres.

PROJECT DESCRIPTION

The applicant has divided the land into eight (8) residential building lots with each lot containing 40,000 sf.

The subdivision included the construction of 900 linear feet (lf.) of roadway. Stormwater generated within the road is captured, treated and disposed of within subsurface leaching catchbasins. Pursuant to the Massachusetts Stormwater Policy, 40% of the suspended solids shall be removed prior to infiltration.

Since the land is within a Zone II, it is restricted by The State Environmental Code Title 5 (Title 5) to one (1) bedroom per 10,000 sf. of land area, exclusive of roadways. The grid subdivision dictates that each lot could have 40,000 sf., therefore each lot would be entitled to four (4) bedrooms.

Under the Harwich Board of Health regulations, any subdivision located within the Pleasant Bay Watershed which divides the land into five (5) or more lots is required to install a shared Title 5 system to serve all the proposed dwelling. In addition, the system shall have a nitrogen reducing treatment component.

The Town of Harwich is actively pursuing connecting the East Harwich area to the Chatham Municipal Sewer System, and, it was presumed that that connection will be available in 2021. The Board of Health restricted development to 4 lots with a shared Title 5 system designed for 16 bedrooms until such time the sewer connection is made.

The construction of the sewer collection system within the subdivision has been completed. To date, the Town of Harwich has not funded the next phase of municipal sewer expansion which includes connection of the subdivision to the municipal system.

Work on the portion of the municipal system that has been funded appears to be behind schedule.

The applicant will soon start building the fourth dwelling within the subdivision. Pursuant to the Board of Health Conditions of Approval, no additional lots may be built upon until such time as the subdivision is connected to the municipal sewer system. After this fourth dwelling is complete, the applicant will be in the position of not being able to continue with the project.

The applicant is requesting a modification of the Board of Health conditions to allow for additional lots to be built upon. The 4 remaining 1 acre lots are large enough to support a total of 16 additional bedrooms.

Pursuant to the Board's regulations, the applicant may construct a shared Title 5 system with I/A technology to serve the subdivision. The existing 16 bedrooms shared system would have to be removed and replaced with a new system that is sized for the 32 total bedrooms. None of the existing system components are adequately sized for a 32-bedroom system.

Rather than incur a severe financial loss by the demolition of the existing septic system, the applicant proposes that each of the remaining undeveloped lots be served by individual Title 5 systems. These systems would remain operational until such time as the Town of Harwich extends the municipal sewer system to the subdivision.

ENVIRONMENTAL IMPACTS

Groundwater Flow

Groundwater maps for the area indicate that groundwater tends to travel in an easterly direction towards the Pleasant Bay estuary.

Groundwater Elevation

Groundwater is estimated to be around elevation 26.0 NAVD based upon the Cape Cod Commission groundwater map or about 55 ft below the surface of the subject property.

The bottom of the proposed stormwater leaching catch basin is in excess of 40 feet above the estimated water table.

Soil Conditions

Hand test borings in the vicinity of the leaching catchbasins to be located adjacent to Orleans Road indicate that suitable soils exist for the on-site disposal of sanitary sewage and stormwater. The proposed Title 5 subsurface sewage disposal system shall be adequately sized for the proposed use.

Environmental Impact on Public and Private Water Supplies

Wastewater

As stated above the property is located within a DEP designated Zone II.

None of the abutting properties are served by a private drinking water well.

Nitrogen loading calculations are attached to this report. The calculations are based upon the Cape Cod Commission, Water Resources Office, Technical Bulletin 91-001, NITROGEN LOADING, dated April 1992.

Calculations are based upon the following assumptions:

32	Number of bedrooms with on-site disposal
3	Average occupancy per dwelling unit (3 persons per unit)
320,000 sf.	Land Area
22,400 sf.	Total of building footprints
11,200 sf.	Total of driveway areas
40,000 sf.	Total of lawn areas
15,000 sf.	Total of miscellaneous site coverages (patios, pools, etc.)
35 ppm	Estimated total nitrogen w/o treatment.

The resultant nitrogen recharge concentration is estimated to be 7.7 ppm.

7.7 ppm is less than the USEPA drinking water standard of 10 ppm.

Environmental Impact on Salt Water Estuaries, Rivers, Streams, Freshwater Ponds and Wetlands.

No saltwater embayments exist within the immediate area.

Pleasant Bay is located more than a mile from the limits of any portion of the project site, with the closest tributary being an old cranberry bog located off Bay Road which is 3/4 of mile away.

Although not required, the project will meet the Cape Cod Commission's guidelines for Developments of Regional Impact which suggest that a 300 ft. buffer between Title 5 soil absorption systems and freshwater receptors is adequate for the sequestration of phosphorous.

CONCLUSION

The project as designed will not have any negative impacts on the public interests protected under the Harwich protective by-law and Board of Health regulations.

NITROGEN LOADING CALCULATION
Proposed Development
Bascom Hollow
April 20, 2018 rev. March 4, 2020

32	Number of Bedrooms w/o Treatment
0	Number of Bedrooms w/ Treatment
320,000	Lot Size (SF)
22,400	Roof Area (SF)
26,200	Pavement Area (SF)
231,400	Natural Area (SF)
40,000	**Lawn Area (SF)**
3,520	Title 5 Flow (GPD)
35	Nitrogen Concentration of Leachate (ppm) w/o Treatment
19	Nitrogen Concentration of Leachate (ppm) w/ Treatment

WASTEWATER

Title 5

3,520 gpd Title 5 flow x 3.785 L/gal=	13323.2	L/d
x nitrogen concentration =	466312.0	mg/d

Actual

3,520 gpd Title 5 flow x 3.785 L/gal x 2.86/8 =	4763.0	L/d
x nitrogen concentration =	166706.5	mg/d

IMPERVIOUS SURFACES

Roof Area

22,400 (SF) x (40 in/yr) x (1ft/12 in) x (28.32 L/cu ft) x 1 yr/365 d)=	5793.3	L/d
x nitrogen concentration (.75 mg/L) =	4345.0	mg/d

Pavement Area

26,200 (SF) x (40 in/yr) x (1ft/12 in) x (28.32 L/cu ft) x 1 yr/365 d)=	6776.1	L/d
x nitrogen concentration (.75 mg/L) =	10164.2	mg/d

LAWN

40,000 (SF) x (3LBS/1000sf/Yr)x (1 yr/365 d) x (454000 mg/lb) x 25%=	37315.1	mg/d

NATURAL

231,400 (SF) x (1.5 FT/Yr)x (28.32 L/cu ft) x (1 Yr/365 d)=	26931.2	L/d

SUMMARY

Title 5

Sum of Nitrogen Loads	518,136 (mg/d) / Total Flow	52,824 (gpd)	9.8	mg/L

Actual

Sum of Nitrogen Loads	218,531 (mg/d) / Total Flow	39,501 (gpd)	5.5	mg/L
		Average	7.7	mg/L

18133

Eastward Companies Business Trust
155 Crowell Road
Chatham, MA 02633
(508) 945-2300

Salem Five Cents Savings Bank
Salem, MA 01970
53-7055/2113

3/4/2020

PAY TO THE ORDER OF Town of Harwich $ **300.00

Three Hundred and 00/100********** DOLLARS

PROTECTED AGAINST FRAUD

Town of Harwich
732 Main Street
Harwich, MA 02645

MEMO Bascom Hollow subdiv - Board of Health filing

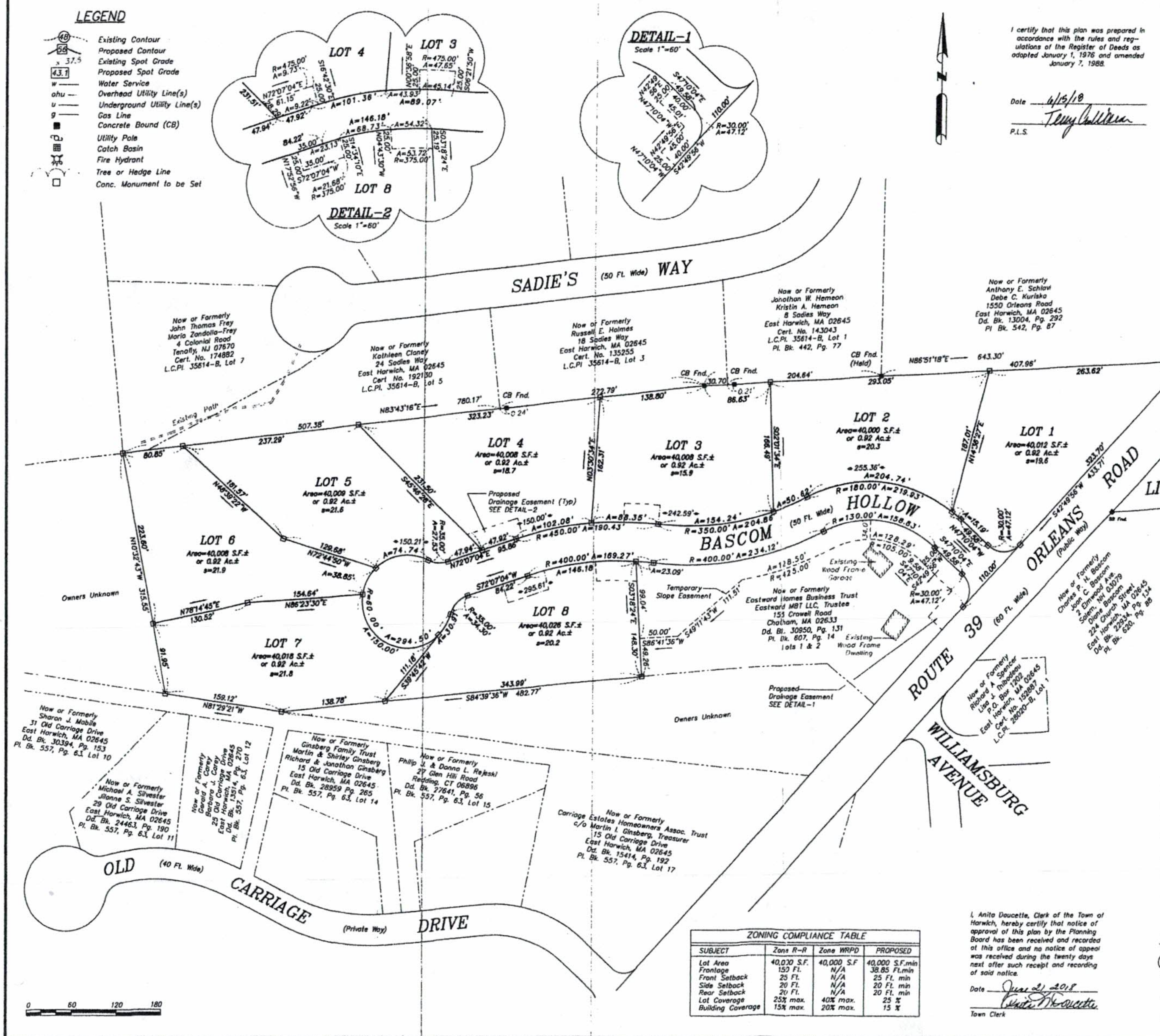
⑈018133⑈ ⑆211370558⑆ 0899036230⑈

Eastward Companies Business Trust - Salem x6230 18133

Town of Harwich	3/4/2020	
	Bascom Hollow subdiv - Board of Health filing	300.00

Salem 5 - Checking	Bascom Hollow subdiv - Board of Health filing	300.00

675/71



I certify that this plan was prepared in accordance with the rules and regulations of the Register of Deeds as adopted January 1, 1976 and amended January 7, 1988.

Date 6/15/18

P.L.S.

ZONING COMPLIANCE TABLE			
SUBJECT	Zone R-R	Zone WRPD	PROPOSED
Lot Area	40,000 S.F.	40,000 S.F	40,000 S.F.min
Frontage	150 Ft.	N/A	38.85 Ft.min
Front Setback	25 Ft.	N/A	25 Ft. min
Side Setback	20 Ft.	N/A	20 Ft. min
Rear Setback	20 Ft.	N/A	20 Ft. min
Lot Coverage	25% max.	40% max.	25 %
Building Coverage	15% max.	20% max.	15 %

I, Anita Doucette, Clerk of the Town of Harwich, hereby certify that notice of approval of this plan by the Planning Board has been received and recorded at this office and no notice of appeal was received during the twenty days next after such receipt and recording of said notice.

Date June 21, 2018

Town Clerk

Board of Health Approval 05-14-18

HARWICH BOARD OF HEALTH RESTRICTIONS

1. The development is restricted to a maximum of 4 lots, 16 bedrooms, 1,760 gallons per day until such time as municipal sewer is available for use.
2. Each lot is restricted to a maximum of 4 bedrooms.
3. In order to prepare for connection to municipal sewer, the waste lines will exit the buildings on the street side.
4. The Harwich Board of Health will not consider any variances from Title 5 of Harwich Board of Health Regulations for any of the lots.
5. The subdivision will be served by town water.

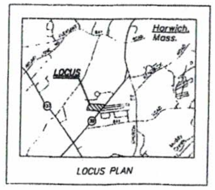
Subdivision subject to Planning Board Covenant recorded in Deed Book 31370, Page 49.

Approval under the Subdivision Control Law required.
HARWICH PLANNING BOARD

Date of Preliminary Application 02-13-18
Date of Preliminary Approval 03-27-18

Date of Definitive Application 04-10-18
Date of Definitive Approval 05-29-18

Date of Endorsement 6-26-19



Assessors' Map 97, Parcels B2-1 & B2-2

OWNERS OF RECORD:

Eastward Homes Business Trust
Eastward MBT LLC, Trustee
155 Crowell Road
Chatham, MA 02633

Deed Book 30950, Page 131
Plan Book 607, Page 14
Lots 1 & 2

Deed Book 30775, Page 86

LOCUS TOTAL AREA
Area=370,605 S.F.±
or 8.5 Ac.±

TERRY ANN WARNER No. 38721

6/15/18

DEFINITIVE DIVISION PLAN

1522 & 1546 Orleans Road (Rte 39), East Harwich, MA

Prepared For

EASTWARD HOMES BUSINESS TRUST

Applicant

CLARK ENGINEERING LLC

156 Crowell Road Suite B, Chatham, MA. 02633
Tel.: (508) 945-5454; Fax.: (508) 945-5458

TERRY A. WARNER, P.L.S.

22 Long Road, Harwich, MA 02645
Tel.: (508) 432-8309

Rev. #	Description of Revision	Date
1	revised proposed road name & proposed building/lot coverages in zoning compliance table	05-09-18
2	added board of health restrictions	06-05-18

Date: 04-10-2018 Drawing No.: 0010151G
Scale: 1" = 60' Sheet No.: 1

2019 Annual Report of the Board of Health

I want to thank the Board of Selectmen for giving us the opportunity to meet with you tonight. In particular, we thank our liaison, Larry Ballantine for being a steady presence at our meetings. During this past year, all members have been sworn in and taken their state ethics course. Except for multiple absences by one member (who has since resigned), there have been no recurrent absences and all meetings are posted and advertised in accordance with the Open Meeting Law. Also, meeting minutes are voted and available to the public for past meetings online as well as in hard copy at the Health Department.

2019 has been challenging year for the Board of Health on many fronts. Looking back at the past year:

- In May, the Board of Health voted (at the recommendation of the Recreation and Youth Department) amendments to the Regulation Prohibiting Smoking in Workplaces and Public Places, to include a ban on smoking on Town owned beaches, recreation areas and other Town operated properties;
- After many conversations concerning the transition of East Harwich to municipal sewering, the BOH has taken several actions. First, we voted to impose no permit fee for sewer connections. The BOH also issued its first waiver to allow a substandard septic system to remain in use until the connection to the sewer is made. We continue to work on extension request applications but there are many factors to consider.
- We were approached by high school students to consider adding a flavor ban in the tobacco sales regulations. After six months of discussion among the Board and tobacco retailers, a regulation update restricting flavored tobacco products to adult only retail stores was adopted. This includes candy flavors as well as mint, menthol and wintergreen. Updated tobacco sales regulations also include a cap on the number of tobacco retail stores in town. As well, new retail stores permitted after the regulations were adopted now must comply with a 500' setback from schools and a 500' setback from other tobacco retailers.
- Finally, the BOH adopted regulations banning the sale of flavored vaping products in Harwich. This came a week before Gov. Baker declared a public health emergency in September, issuing a temporary vaping product ban state wide. This latter action banned the sale of all vaping products and devices for a 4 month period to allow time for the CDC to study the vaping associated lung injuries.
- We voted to raise the legal purchase age for tobacco products from 18 to 21 years old. This would cover sales to anyone within the Town of Harwich.

Other Board of Health 2019 stats are as follows:

19 properties requested Variances from Title 5

8 Subdivisions were reviewed

3 Environmental Impact Reports were reviewed

3 properties requested reconsideration of previous orders of conditions

3 Public Beaches requests sampling variances

4 show-cause hearings were held

3 properties requested extensions on septic upgrades

1 food service establishment requested amendments on conditions

1 discussion was held regarding allowing dogs in outdoor spaces of restaurants

1 waiver was requested to use failed septic system until sewer is available

At this time, I would like to recognize the other Board members: Matthew Cushing, M.D., Ron Dowgiallo, D.M.D. Sharon Pfleger, MS, and our newest member Matt Antoine. And we would like to give our thanks to former Vice Chairman Frank Boyle and former BOH member Cynthia Bayerl for their time and energy while they served.

In closing, let me say it has been an honor serving the Town of Harwich this past year.

Respectfully submitted,

Pamela R Howell, RN

Harwich Board of Health Chair

VISITING NURSE ASSOCIATION OF CAPE COD

Member Cape Cod Healthcare

Hyannis - Main Office
255 Independence Drive
Hyannis, MA 02601

Falmouth
67 Ter Heun Drive
Falmouth, MA 02540

Hospice and Palliative Care
434 Route 134
S. Dennis, MA 02660

Public Health & Wellness
434 Route 134, D3
South Dennis, MA 02660

Private Services
255 Independence Drive
Hyannis, MA 02601

67 Ter Heun Drive
Falmouth, MA 02540

57 Obery Street, Unit 3
Plymouth, MA 02360

Philanthropy
P.O. Box 370
Hyannis, MA 02601

Tradewinds Adult Day Health
290 Route 130, Box 6
Sandwich, MA 02563

Compass Adult Day Health
One Auston Rd., Unit F
E. Harwich, MA 02645

Child Care Center
67B Ter Heun Drive
Falmouth, MA 02540

Volunteer Services
434 Route 134
S. Dennis, MA 02660

Medicare/Medicaid Certified
Joint Commission Accredited

February 19, 2020

Meggan Eldridge
Health Director
Town of Harwich
732 Main St.
Harwich, MA 02645

Dear Meggan,

I wanted to express my gratitude for allowing me once again to share the Nutrition Detectives Program with the fourth grade students at Harwich Elementary School. As always, I was very impressed with their enthusiasm participating with the hands on activity and their grasp of misconceptions regarding food labels. I truly enjoyed the time spent with them and hope that the information shared will help provide "food for thought" in guiding them along the path to good health and wellness.

From the attached test results, those who participated clearly had a better understanding about reading food labels and were able to utilize the "5 Clues" to make healthier food choices. According to Dr. Katz, this is the optimal age to teach them the importance of eating healthy foods and how it impacts their bodies. I am happy that programs such as this one can be helpful to children and their families. It was my privilege to share it.

Please feel free to provide me any feedback on the program. I can be reached at lbushy@capecodhealth.org.

Best wishes for good health in 2020!

Lisa Bushy, RN
VNA of Cape Cod

Harwich Elementary
Nutrition Detectives 2020

Classroom		Grade	#Students	Pre-test	Correct Answers	Post-test	Correct Answers
Branchut		Grade 4	Pre-15	100%	0	100%	6
			Post -13	90%	0	90%	2
				80%	1	80%	0
				70%	5	70%	3
				60%	2	60%	1
				50%	0	50%	1
				40%	2	40%	0
				30%	1	30%	0
				20%	1	20%	0
				10%	3	10%	0
Keith		Grade 4	Pre-15	100%	0	100%	9
			Post -15	90%	1	90%	3
				80%	1	80%	2
				70%	6	70%	0
				60%	3	60%	1
				50%	1	50%	1
				40%	0	40%	0
				30%	1	30%	0
				20%	2	20%	0
				10%		10%	0
McManamin		Grade 4	Pre-16	100%	1	100%	7
			Post - 16	90%	1	90%	2
				80%	2	80%	1
				70%	2	70%	2
				60%	5	60%	2
				50%	3	50%	1
				40%	2	40%	1
				30%	0	30%	0
				20%	0	20%	0
				10%	0	10%	0
Marcinuk		Grade 4	Pre-14	100%	3	100%	8
	Pre test =	Post Video:		90%	2	90%	1
			Post- 12	80%	4	80%	0
				70%	0	70%	0
				60%	1	60%	0
				50%	1	50%	3
				40%	1	40%	0
				30%	0	30%	0
				20%	2	20%	0
				10%	0	10%	0

Harwich Elementary

Nutrition Detectives 2020

Zabielski		Grade 4	Pre-0	100%		100%	4
			Post -11	90%		90%	1
		Post Test Only		80%		80%	0
				70%		70%	1
				60%		60%	2
				50%		50%	1
				40%		40%	1
				30%		30%	0
				20%		20%	0
				10%		10%	0

Clearly		Grade 4	Pre-9	100%	5	100%	10
			Post -15	90%	0	90%	2
				80%	1	80%	2
				70%	1	70%	0
				60%	2	60%	1
				50%	0	50%	0
				40%	0	40%	0
				30%	0	30%	0
				20%	0	20%	0
				10%	0	10%	0

Town of Harwich
Board of Health
732 Main Street Harwich, MA 02645
508-430-7509 – Fax 508-430-7531
E-mail: health@town.harwich.ma.us

COPY

February 25, 2020

Maulik Corporation
Bahecharbhai Patel
Value Mart
435 Route 28
Harwichport, MA 02646

RE: Food Services Permit Suspension Hearing
Value Mart, Harwichport
435 Route 28, Harwich

Dear Mr. Patel,

At a meeting of the Harwich Board of Health on February 18, 2020, a food service permit suspension hearing was conducted for repeat violations of 105 CMR 590.000: The State Sanitary Code and the 2013 FDA Food Code.

At this hearing, you were represented by your attorney, Matthew Porter and assured the Board of Health that management of the store has changed hands and will be more vigilant regarding food safety compliance.

After considerable review and discussion, the Board of Health voted to impose the following conditions:

1. Owner must provide a signed contract with a pest control company by Friday, February 21, 2020 at 4:00 p.m.
2. Owner must provide invoices for food products to show where they are coming from.
3. Written plan of action required for monitoring use-by dates.
4. Weekly inspections with 100% compliance.
5. All outside trash, including in the marsh area, will be cleaned up within 2 weeks of the meeting date.
6. Evidence that egress and ingress for all rodents has been eliminated within 2 weeks of the meeting date.
7. If owner is unable to attain the above, recommended immediate suspension of food service permits for 30 days.

Please do not hesitate to contact me if you have any questions or would like to discuss this matter further.

Regards,

Meggan Eldredge

Meggan Eldredge, R.S., CHO
Health Director

Town of Harwich
Board of Health
732 Main Street Harwich, MA 02645
508-430-7509 – Fax 508-430-7531
E-mail: health@town.harwich.ma.us

COPY

February 24, 2020

Paresh Patel
21 Plus Smoke Shop
Harwich Corp.
2 Bettys Lane
Harwich, MA 02645

RE: Board of Health Decision
21 Plus Smoke Shop
1421 Orleans Road-Unit # 9

Dear Mr. Patel:

At their February 18, 2020 meeting, the Board of Health heard your request to extend the deadline of your approved tobacco permit application for 21 Plus Smoke Shop.

After discussion, the Board voted to approve your request, and granted an extension until March 17, 2020.

The Board also voted that if you will require an additional extension, that your request be made in writing and submitted to the Health Department.

Feel free to contact our office if you have any questions or need any additional information.

Regards,

Meggan Eldredge

Meggan Eldredge, R.S., CHO
Health Director

CC: Board of Health
File

OFFICE OF THE SELECTMEN

PHONE (508) 430-7513
FAX (508) 432-5039

732 MAIN STREET, HARWICH, MA 02645

February 21, 2020

Meggan Eldredge, RS, CHO
Health Director
Town of Harwich
732 Main Street
Harwich, MA 02645

Dear Ms. Eldridge,

At a public meeting of the Board of Selectmen held on Monday February 10, 2020, the Board approved your request to increase the timeline for mandatory connection to the municipal sewer from one year to two years and to include Registered Sanitarians as designers for sewer connections that have a proposed discharge of less than 2,000 gallons per pay.

Sincerely,

HARWICH BOARD OF SELECTMEN

Larry G. Ballantine, Chair

Edward J. McManus, Vice Chair

Stephen P. Ford, Clerk

Donald F. Howell

Michael D. MacAskill

CC: Pamela Howell, R.N. Chairman
Harwich Board of Health