THE CHILD SAFE PLAYING FIELD ACT –

HAZARDS AND RISK

MAYFIELD ATHLETIC FIELDS
JANUARY 22, 2019

GOALS:

- Discuss relative risks of herbicide controls
- How to evaluate risks of chemical herbicide controls when compared to other chemicals.
- Reach an informed decision on relative merits of using chemical controls vs. student athlete injury.
- Consider a program of chemical treatments in 2019 and future years.

LAWS OF NEW YORK, 2010

CHAPTER 85

"Child Safe Playing Fields Act"

AN ACT to amend the environmental conservation law, the education law and the social services law, in relation to the use and guidance of pesticide alternatives

Became a law May 18, 2010, with the approval of the Governor.
Passed by a majority vote, three-fifths being present.

2. No school shall apply pesticide to any playgrounds, turf, athletic or playing fields, except that an emergency application of a pesticide may be made as determined by the county health department or for a county not having a health department such authority as the county legislature shall designate, the commissioner of health or his or her designee, the commissioner of environmental conservation or his or her designee, or, in the case of a public school, the school board.

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What is an Emergency?

- When the problem cannot be managed with the allowed products and/or alternative pest management methods
- When the pest problem is not routine and is a threat to public health.
- When the pesticide application is not for purely aesthetic reasons

Paraphrase from:
Emergency Pesticide Application Determinations at Schools and Day Care Centers
https://www.health.ny.gov/environmental/pests/guidance_85.htm

Pesticide means:

(1) any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any insects, rodents, fungi, weeds, or other forms of plant or animal life or viruses, except viruses on or in living humans/or other animals, which the department shall declare to be a pest . . .

6 CRR – NY 326 1 NY – CRR, Title 6, Chapter IV, Subchapter A. Pesticide Control, Part 325. Application of Pesticides, 325.1 Definitions

Pesticides include:

- Insecticides
- Rodenticides
- Fungicides
- Herbicides

Adverse effects of using Pesticides may include:

1. Health and well being of student athletes
2. Threat to the environment
3. Political challenges

Categorizing Types of Risk of Sports on Athletic Fields:

Biological – bacteria, viruses, insects, plants, birds, animals, and humans, etc.

Chemical – depends on the toxic properties of the chemical

Ergonomic – repetitive movements

Physical – collision, ground impact, etc.

Safety – slipping/tripping hazards, compaction or turf breakdowns

Psychological – stress, violence, loss

Adverse effects of using Pesticides may include:

1. Health and well being of student athletes
2. Threat to the environment
3. Political challenges

Beneficial effects of using Pesticides may include:

1. Establishment of a healthy turf, leading to the
2. Health and well being of student athletes in a
3. Cost effectiveness manner

Risk perception is the subjective judgment people make about the severity and probability of a risk, and may vary person to person.

Any human endeavor carries some risk, but some are much riskier than others.

Soccer:

Classified as a high- to moderate-intensity contact/collision sport. Care of the Young Athlete - Sullivan, Anderson, American Academy of Pediatrics, 2000

Higher injury rate than field hockey, rugby, basketball and football. British Journal of Sports Medicine, 2005: 39(8)
Pediatrics 2002: 110(3)

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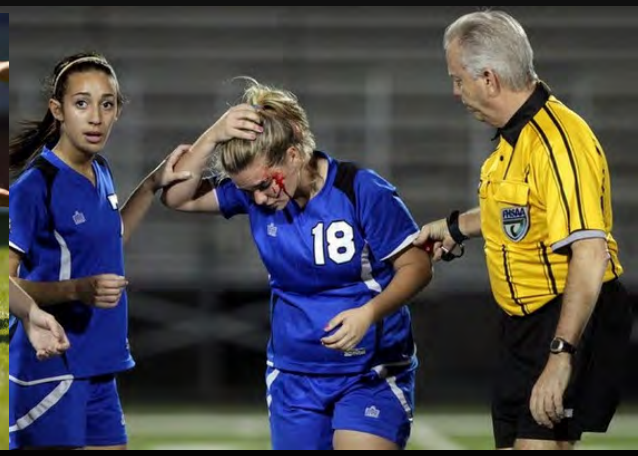
An estimated 186,544 soccer-related injuries in 2006.

80% affected participants younger than 24 years

44% occurred in participants younger than 15 years

US Consumer Product Safety Commission
National Electronic Injury Surveillance System



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INJURIES - Over an entire soccer season

Girls' teams may expect 4.0 injuries per season

Boys' teams may expect 3.5 injuries per season

American Journal of Sports Medicine, 2008; 36(2)

The risk of injury is greater during competition than during practice sessions.

American Journal of Sports Medicine, 2006 34 (10)

Soccer:

Most injuries occurring from:

Player-to-player contact
Player-to-goal post contact
Player-to-ball contact
Player-to-ground contact

American Journal of Sports Medicine 2002; 30 (5)




Surface hardness and irregularity are the two main factors identified by players as cause of related-pitch-injury occurrence. The mechanical characteristics of sports surfaces related to athlete-surface interaction could be divided into (i) vertical behavior during impact and (ii) horizontal behavior (traction force) relating to the grip of shoes on the surface.

Influence of Playing Surface on ACL Injuries for Non-Contact Sports:
Dr. P Rouch, G. Charpak, X. Drevelle, P. Thoreux:
SportsTurf Managers Association, February 2017

Healthy grass turf cushions a fall
and provides ideal traction.

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Men's Soccer Injuries

Data from the 2004/05 – 2008/09 Seasons
NCAA/
Datalys Center for Sports Injury Research and Prevention/
STOP Sports Injuries

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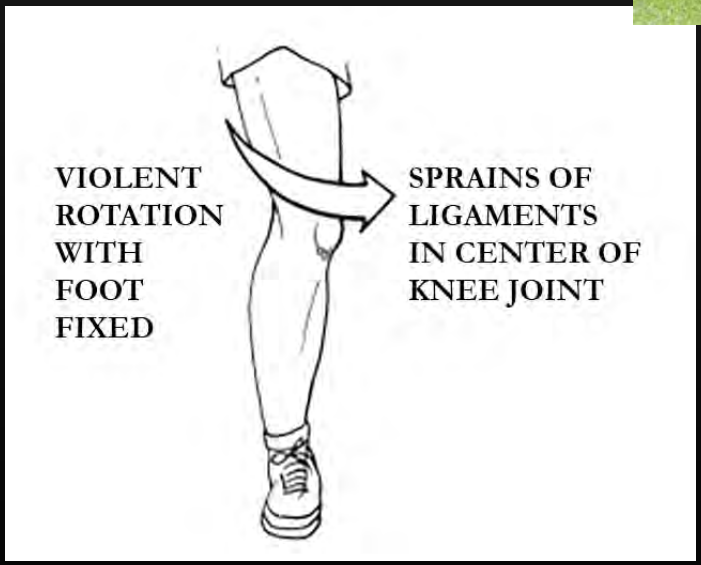
ACL Injury



- Landing leg is extended.
- Landing foot is firmly fixed to the ground.
- The opposing leg drives through, rotating the hips and torso.
- Rotational forces transfer to the knee.
- Creating excessive loading on the knee.
- Causing injury to the Anterior Cruciate Ligament

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- A healthy, dense turf cut to the correct height:
  - Decreases player to surface injuries by
  - Reducing the traction between cleat and ground surface
  - Allowing the foot to rotate with the knee
- Shallow rooted weeds, bare soil or compacted soil will increase traction and increase joint injury
- Clumpy weeds, bare spots and holes in turf will increase tripping hazards

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Contributing Factors to Injury:

Holes and other irregularities contribute to lower extremity injuries

Uneven playing surfaces can create excessive loading on ligaments and muscles and contributes to improper landing after jumping.

British Journal of Sports Medicine 2005: 39(8)

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Challenges to a heathy turf

Athletic Use

- Overuse
- Soil compaction
- Physical wear
- Tearing/shearing/divotting of Turf
- Resulting in settlement / holes / bare spots leading to
- Open soil & weed germination

CRABGRASS

- Digitaria sanguinalis (Hairy Crabgrass)
- Digitaria ischamemum (Smooth Crabgrass)

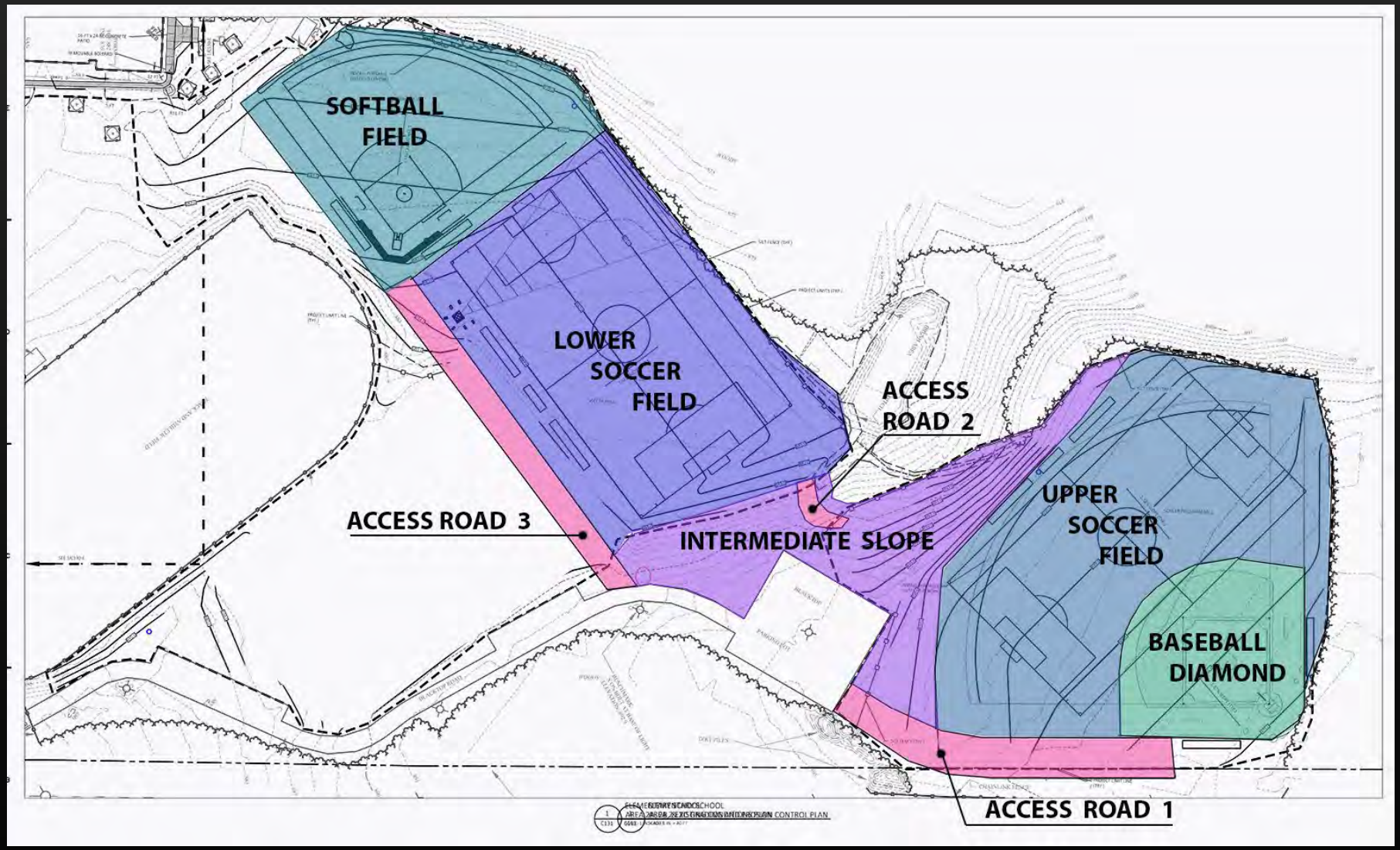
Introduced in 1894 by the U.S. Patent Office as potential forage crops.

Characteristics of Digitaria -

- Prostrate grass
- Seed heads grow horizontally
- Producing seed heads at mowing heights < 1/2-inch
- Produces shallow roots that absorb water before reaching deeper rooting plants
- Tillering occurs within weeks of germination
- One plant can produce 150,000 seeds annually
- 50% of seed will germinate the following spring
- Creation of a large seed bank that will persist for years
- Thrives during hot weather when cool season grasses are under stress or have gone dormant



Mayfield Athletic Fields



Elementary School Athletic Fields 2016 - 2018

Mayfield Athletic Fields

June 2017

Mayfield Athletic Fields

June 2017

Mayfield Athletic Fields

August 2017

Mayfield Athletic Fields

August 2017

Mayfield Athletic Fields

October 2017

Mayfield Athletic Fields

April 2018

Mayfield Athletic Fields

April 2018

Mayfield Athletic Fields

May 2018

Mayfield Athletic Fields

August 2018 – Softball Outfield

Mayfield Athletic Fields

August 2018 – Lower Soccer Field

Mayfield Athletic Fields

August 2018 – Upper Soccer Field & 3rd Base Line

Mayfield Athletic Fields

August 2018 – Upper Soccer Field

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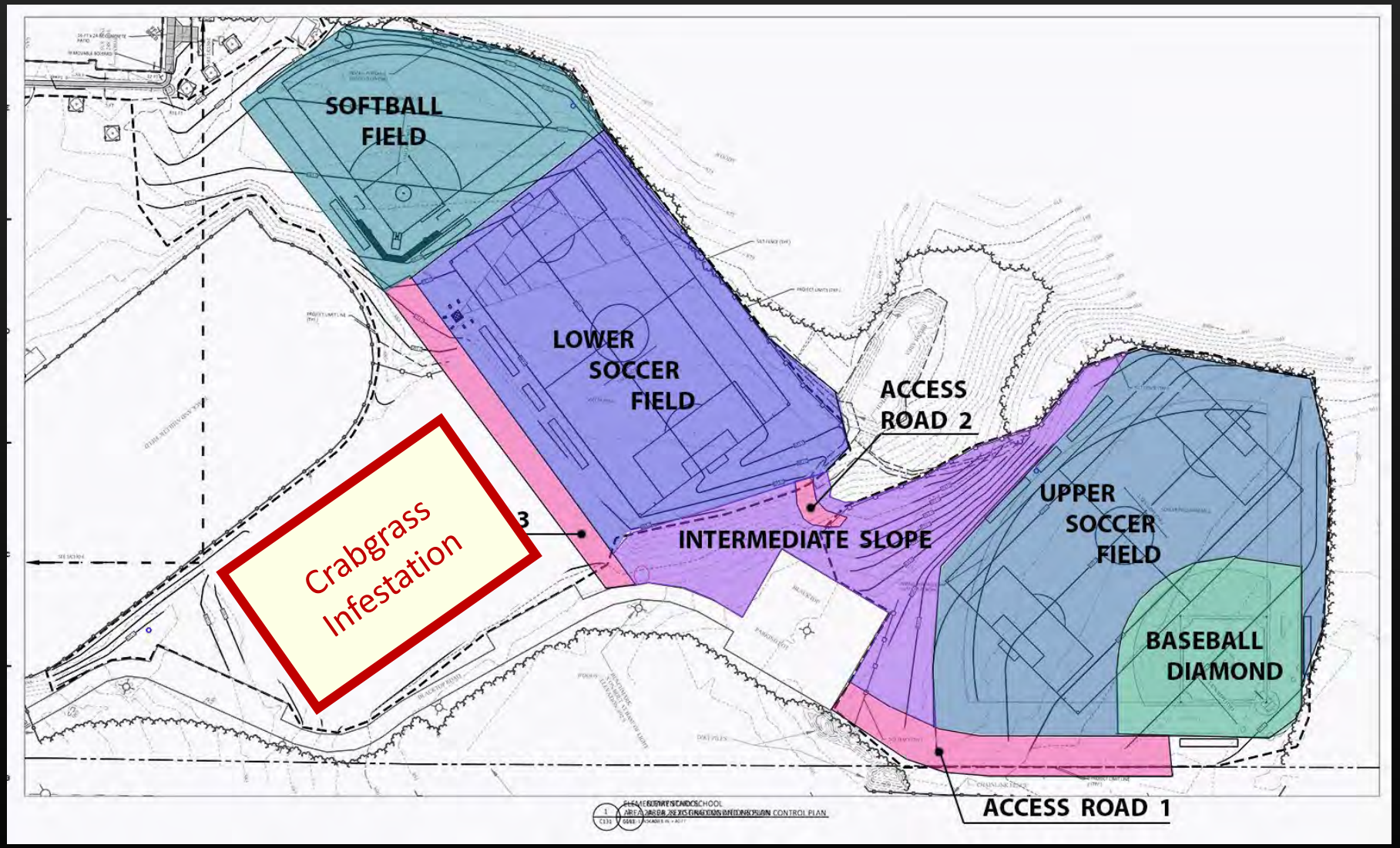

Elementary School Athletic Fields 2016 - 2018

Mayfield Athletic Fields

Field Conditions

1. Fields infested with Digitaria
2. An adjacent seed bank that will colonize the practice fields
3. Likelihood of seasonal decline in desirable turf species
4. Decline in the turf density of the athletic fields
5. Diminished safety of the student athletes
6. Loss of investment by the community

Goals

1. Explain relative risks of herbicide controls
2. How to evaluate risks of chemical herbicide controls when compared to other chemicals.
3. Reach an informed decision on relative merits of using chemical controls vs. student athlete injury.
4. Consider a program of chemical treatments in 2019 and future years.

Herbicide Treatment

Environment

- Aquatic Toxicity
- Terrestrial Toxicity
- Persistence and Degradability
- Bioaccumulative Potential
- Mobility in Soil

Skull and Crossbones

- Acute Toxicity
- Oral: toxic if swallowed
- Dermal: toxic in contact with skin
- Inhalation: toxic if inhaled

Exclamation Mark

- Irritant Skin and Eyes
- Skin Sensitizer
- Acute Toxicity Harmful
- Narcotic Effects
- Respiratory Tract Irritant
- Hazardous to Ozone

Health Hazard

- Carcinogen
- Mutagenicity
- Reproductive Toxicity
- Respiratory Sensitizer
- Target Organ Toxicity
- Aspiration Toxicity

OSHA – Occupational Safety and Health Administration
Hazard Classification Guidance

Natural Chemicals: not synthetic, i.e. not man-made

Example of non-toxic natural chemicals:

- Dihydrogen monoxide (H_2O): water
- Sucrose ($C_{12}H_{22}O_{11}$): table sugar
- Ethyl alcohol (C_2H_5OH): ethanol, drinking alcohol

Examples of toxic natural chemicals:

- Muscimol ($C_4H_6N_2O_2$): found in agaric mushrooms
- Amygdalin ($C_{20}H_{27}NO_{11}$): found in apple seeds
- Solanine ($C_{45}H_{73}NO_{15}$): found in green potatoes

Synthetic Chemicals: not found in nature, i.e. man-made.

Examples of non-toxic synthetic chemicals:

- Teflon (C_2F_4): non-stick pans
- Propylene glycol ($C_3H_8O_2$): food additive
- Aspartame ($C_{14}H_{18}N_2O_5$): artificial sweetener

Example of toxic synthetic chemicals:

- Aspirin ($C_9H_8O_4$): pain-relieving drug
- Ethylene glycol ($C_2H_6O_2$): anti-freeze
- Sodium thiopental ($C_{11}H_{17}N_2NaO_2S$): lethal injections

Herbicide: a substance that is toxic to plants

Synthetic Herbicides:

- 2.4-D ($C_8H_6C_{12}O_3$)
- Glyphosate: ($C_3H_8NO_5P$)
- Agent Orange ($C_8H_6C_{12}O_3 + C_{12}H_4Cl_4O_2 + C_8H_5Cl_2O_3$)

Natural Herbicides:

- Juglone (C10H6O3): occurring in walnut trees
- Catechin (C15H14O6): occurring in spotted knapweed
- Salt (NaCl)
- Citric Acid ($C_6H_8O_7$)
- Corn Gluten Meal: derived by the wet milling of corn

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Herbicide: a substance that is toxic to plants

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Table 3: Active Ingredients Exempted Under 25(b) FIFRA	
Castor oil (U.S.P. or equivalent)	Linseed oil
Cedar oil	Malic acid
Cinnamon and cinnamon oil	Mint and mint oil
Citric acid	Peppermint and peppermint oil
Citronella and Citronella oil	2-Phenethyl propionate (2-phenylethyl propionate)
Cloves and clove oil	Potassium sorbate
Corn gluten meal	Putrescent whole egg solids
Corn oil	Rosemary and rosemary oil
Cottonseed oil	Sesame (includes ground sesame plant) and sesame oil
Dried Blood	Sodium chloride (common salt)
Eugenol	Sodium lauryl sulfate
Garlic and garlic oil	Soybean oil
Geraniol	Thyme and thyme oil
Geranium oil	White pepper
Lauryl sulfate	Zinc metal strips (consisting solely of zinc metal and impurities)
Lemongrass oil	

EPA 25(b) FIFRA* exempt pesticides

*Federal Insecticide, Fungicide, and Rodenticide Act

"Child Safe Playing Fields Act"

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EPA 25(b) FIFRA exempt pesticides with
Herbicide Potential

Alternative weed control: mechanical removal, boiling water, steam, fire, vinegar, salt, citric acid, corn gluten meal

Some will be impractical – boiling water and steam
Some expensive – mechanical removal

Some – fire, salt and citric acid - will be toxic to the existing turf grasses –

- Bluegrass
- Ryegrass
- Fescue

One may have limited merit

Corn Gluten Meal

If crabgrass is knocked back over several seasons with

Pre-emergent Herbicides

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The Case for Pre-emergent Herbicides

- Emergency exemption allowed under NY Law
- Board of Education can declare an Emergency
- Cost Effective – Contractor is willing to apply herbicides spring 2019 and maintain through 2019
- Chemically effective: one season may achieve success
- Chemical Risk to Student Athletes < Risk of Injury
- Alternative strategies are limited:
  - Accept fields as they are
  - Use only EPA herbicides
  - School District lays sod (?)
  - Contractor lays sod (?)
  - Legal action (?)

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Toxicity: poisonous

"All substances are poisons; there is none which is not a poison. The right dose differentiates a poison from a remedy." - Paracelsus (1493 to 1541)

Sodium nitrite: food additive to prevent botulism.
World Health Organization Essential Medicine.
Lethal to humans at doses of 1 gram.

Sodium fluoride: source of fluoride in drinking water.
Lethal to humans at doses of 5 to 10 grams.

Acetylsalicylic acid: aspirin, a common pain reliever.
Lethal to humans at doses of 27 grams/120 pound person.
84 tablets at 325 mg/tablet.

Determining Equivalent Lethality

LD_{50} = **Lethal Dose 50** is the amount of a chemical, given all at once, which causes the death of 50% of a group of test animals.

Expressed as the mass of the chemical per unit mass of the test subject (mg/kg)

Exposure is by the 3 major workplace exposure routes:

Mouth (oral)
Skin (dermal)
Breathing (inhalation)

LC_{50} = **Lethal Concentration 50** is the lethal inhalation concentration for a 4 hour exposure.

OSHA's Hazard Communication Standards.

Substance	Animal, Route	LD_{50} LD50	Uses	Hazard Communication Pictogram
Not Classified > 2000 mg/kg bodyweight - Presumed not acutely toxic				
Lactose	rat, oral	>10,000 mg/kg	Milk sugar.	
Aspartame	mice, oral	>10,000 mg/kg	Artificial sweetener	
Urea	rat, oral	8,471 mg/kg	Natural metabolite of nitrogen-containing compounds	
Cadmium sulfide	rat, oral	7,080 mg/kg	Pigment	
Ethanol	rat, oral	7,060 mg/kg	Drinking alcohol	
Melamine	rat, oral	6,000 mg/kg	Melamine + formaldehyde = Formica, dry erase boards	
Methanol	rat, oral	5,628 mg/kg	Wood alcohol	
Fructose	rat, oral	4,000 mg/kg	Fruit sugar	
Sodium chloride	rat, oral	3,000 mg/kg	Table salt	
Category 4 > 300 and ≤ 2000 mg/kg bodyweight				
Paracetamol (acetaminophen)	mouse, oral	338 mg/kg	Medicine for pain relief	
Category 3 > 50 and ≤ 300 mg/kg bodyweight				
Hydrochloric acid	rat, oral	238–277 mg/kg	Precusor to PVC	
MDMA	rat, oral	160 mg/kg	Ecstasy, a recreational drug.	
Dichlorodiphenyltrichloroethane (DDT)	mouse, oral	135 mg/kg	Historic insecticide. Eliminated malaria in North America	
Uranium	mice, oral	114 mg/kg (est.)	Uranium 238, nuclear isotope. Power generation. Weapons.	
Cocaine	mouse, oral	96 mg/kg	Recreational drug	
Methamphetamine	rat, intraperitoneal	57 mg/kg	Recreational drug, treatment for ADHD	
Sodium fluoride	rat, oral	52 mg/kg	Source of floride in drinking water	
Category 2 > 5 and ≤ 50 mg/kg bodyweight				
Category 1 ≤ 5 mg/kg bodyweight				
Nicotine	mice, oral	3.34 mg/kg	Recreational drug. Insecticide	
Sodium cyanide	rat, oral	6.4 mg/kg	Industrial mining. Poison.	
Sarin	mouse, injection	0.172 mg/kg	Chemical weapon	
Polonium-210	human, inhalation	0.00001 mg/kg (est.)	Power source. Russian poison.	

Not Classified – Warning – May be Harmful if Swallowed

Category 4 – Warning – Harmful if Swallowed

Category 3 – Danger – Toxic if Swallowed

Category 2 – Danger - Fatal if Swallowed

Category 1 – Danger - Fatal if Swallowed

Not Classified:
≥ 2000 mg/kg

Category 4
300 mg/kg to
≤2000 mg/kg

Category 3
50 mg/kg to
≤300 mg/kg

Category 2
5 mg/kg to
≤50 mg/kg

Category 1
≤5 mg/kg

Acute Oral Toxicity Categories and Classification Criteria

Mayfield Athletic Fields

Category 3 > 50 and ≤ 300 mg/kg bodyweight		
Hydrochloric acid	238–277 mg/kg	Precusor to PVC
Ketamine	229 mg/kg	Anethesia
Aspirin (acetylsalicylic acid)	200 mg/kg	Medication
Caffeine	192 mg/kg	Stimulant
Sodium nitrite	180 mg/kg	Food additive to prevent boulism. WHO Essential Medicines
MDMA	160 mg/kg	Ecstasy, a recreational drug.
Dichlorodiphenyltrichloroethane (DDT)	135 mg/kg	Historic insecticide. Eliminated malaria in North America
Uranium	114 mg/kg (est.)	Uranium 238, nuclear isotope. Power generation. Weapons.
Cocaine	96 mg/kg	Recreational drug
Methamphetamine	57 mg/kg	Recreational drug, treatment for ADHD
Sodium fluoride	52 mg/kg	Source of floride in drinking water
Category 2 > 5 and ≤ 50 mg/kg bodyweight		
Capsaicin	47.2 mg/kg	Active component of chilli peppers
Ricin	20–30 mg/kg	Natural poison from the seeds of the caster oil pl
Heroin	21.8 mg/kg	Recreational drug
Lysergic acid diethylamide (LSD)	16.5 mg/kg	Hallucinogenic drug
Category 1 ≤ 5 mg/kg bodyweight		
Nicotine	3.34 mg/kg	Recreational drug. Insecticide
Sodium cyanide	6.4 mg/kg	Industrial mining. Poison.
Strychnine	1–2 mg/kg (est.)	Small animal pesticide.
Plutonium	0.320 mg/kg	Nuclear weapons. Power generation.
Fentanyl	0.300 mg/kg	Pain medication. Anesthesia.
Sarin	0.172 mg/kg	Chemical weapon
Polonium-210	0.00001 mg/kg (est.)	Power source. Russian poison.

Category 1, 2 and 3 Chemicals
Danger - Acutely Toxic

Mayfield Athletic Fields

Aspirin: 200 mg/kg
Caffeine: 192 mg/kg
Cocaine: 96 mg/kg

Danger: Toxic if Swallowed

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Danger:
Toxic if Swallowed

Heroin: 21.8 mg/kg
LSD: 16.5 mg/kg

Danger:
Fatal if Swallowed

Category 1, 2 and 3 Chemicals
Danger - Acutely Toxic

Mayfield Athletic Fields

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Danger:
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Danger:
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Category 1, 2 and 3 Chemicals
Danger - Acutely Toxic

Mayfield Athletic Fields

Category 4 > 300 and ≤ 2000 mg/kg bodyweight		
Delta-9-tetrahydrocannabinol (THC)	1,270 mg/kg	Psychoactive con
Cannabidiol (CBD)	980 mg/kg	Non-psycho reatment for epilepsy
Metallic Arsenic	763 mg/kg	Alloy of d bullets
Ibuprofen	636 mg/kg	Medi
Paracetamol (acetaminophen)	338 mg/kg	

Category 4 Chemicals - Warnin wallowed

Warning:
Harmful if Swallowed

THC: 1,270 mg/kg
Arsenic: 763 mg/kg
Ibuprofen: 636 mg/kg

Acute Oral Toxicity Categories and Classification Criteria

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Citric Acid	5040 mg.kg	Citrus fruits
Fructose	4,000 mg/kg	Fruit sugar
Sodium chloride	3,000 mg/kg	Table salt

Sucrose: 29,700 mg/kg
Lactose: >10,000 mg/kg
Fructose: 4,000 mg/kg
Sodium Chloride: 3,000

Warning:
May be Harmful if Swallowed

Not Classified – Warning: May be Harmful if Swallowed

Acute Oral Toxicity Categories and Classification Criteria

Mayfield Athletic Fields

SECTION 7: HANDLING AND STORAGE

Handling: RECOMMENDATIONS ARE INTENDED FOR MANUFACTURING, PACKAGING AND COMMERCIAL BLENDING WORKERS. PESTICIDE APPLICATORS AND WORKERS must refer to the product label and Directions for Use attached to the product for Agricultural Use Requirements in accordance with the EPA Worker Protection Standard 40 CFR part 170. Handle and open container in a manner as to prevent spillage. Do not eat, drink or smoke while handling this product. Immediately wash off accidental splashes of the concentrate or spray mixture from skin, clothing and out of eyes.

Storage: **See pesticide label for full information on product storage.** Do not contaminate water, food or feed by storage of this product. Store away from sources of heat, out of direct sunlight and away from incompatible materials. Pesticides should be stored in secured areas away from children and animals.

Storage Temperature (Min/Max): Do not store below 32°F.

Product Incompatibilities: Strong oxidizing agents.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Users of a pesticide product must refer to the product label for personal protective equipment requirements.

Exposure Guidelines:

COMPONENT	OSHA PEL	ACGIH TLV	NIOSH REL
Particulates not otherwise listed	TWA: 5 mg/m³	TWA: 10 mg/m³	

Engineering Controls: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs or other specified exposure limits. Local exhaust ventilation is preferred.

Respiratory Protection: In areas of poor ventilation, use a NIOSH approved respirator with cartridges/canisters approved for pesticides.

Eye Protection: Chemical goggles or safety glasses and full-face shield.

Protective Gloves: Chemical-resistant gloves such as barrier laminate, butyl rubber, nitrile, neoprene rubber, polyvinyl chloride (PVC) or Viton.

Other Protective Clothing: Long-sleeved shirt, long pants and shoes plus socks.

General Safety Measures: Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing immediately after handling this product. Wash outside of gloves before removing. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Off-white, tan or gray powder	**Upper/Lower Flammability Limits:**	Not determined
Odor:	Characteristic of sulfur-containing compounds	**Vapor Pressure:**	Not determined
Odor Threshold:	Not determined	**Vapor Density:**	Not determined
pH (1% dispersion):	7.31	**Bulk Density:**	0.226 g/mL
Melting /Freezing Point:	131°F (55°C)	**Solubility:**	Not determined
Boiling Point/Range:	Not determined	**Partition Coefficient:**	Not determined
Flash Point:	Not determined	**Auto-ignition Temperature:**	Not determined
Evaporation Rate:	Not determined	**Decomposition Temperature:**	Not determined
Flammability:	Not determined	**Viscosity:**	Not determined

SECTION 10: STABILITY AND REACTIVITY

Reactivity: None known

Chemical Stability: Stable under normal storage and handling conditions.

Possibility of Hazardous Reactions: No potential for hazardous reactions known.

Conditions to Avoid: Temperatures below freezing.

Incompatible Materials: Strong oxidizing agents

Hazardous Decomposition Products: Thermal decomposition may produce toxic carbon and nitrogen oxides.

SECTION 11: TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Eye contact, Skin contact, Inhalation, ingestion

Symptoms of Exposure: Mild eye and/or skin irritation.

Oral LD_{50}: 4,991 mg/kg (Estimated based upon component data)

Dermal LD_{50}: 3,415 mg/kg (Estimated based upon component data)

Inhalation LC_{50}: >5.0 mg/L (4-hour)(Estimated based upon component data)

Eye Irritation/Damage: Not anticipated to cause more than mild mechanical irritation based upon component data.

Skin Corrosion/Irritation: Not anticipated to cause more than mild skin irritation based upon component data.

Skin Sensitization: Non-sensitizer, based upon component data.

Chronic/Subchronic Toxicity: No data available

Mutagenicity: No data available

Reproductive Toxicity: No data available

Neurotoxicity: No data available

Target Organs: In animals, dithiopyr has been reported to effect the liver, kidney, adrenal gland, thyroid, gall bladder and blood.

Aspiration Hazard: Not anticipated to be an aspiration hazard.

Carcinogenicity: See below.

Chemical Name	ACGIH	IARC	NTP	OSHA
No components listed				

SECTION 12: ECOLOGICAL INFORMATION

Environmental Hazards Statement from FIFRA Regulated Pesticide Label:
This product is toxic to fish and highly toxic to other aquatic organisms including oysters and shrimp. Use with care when applying to turf areas adjacent to any body of water. Drift and runoff from treated turf may adversely affect aquatic organisms in adjacent aquatic sites. Do not apply directly to water or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not apply when weather conditions favor drift from treated areas. Do not contaminate water when disposing of equipment washwaters.

ECOTOXICITY DATA:

Fish Toxicity:	No data available
Aquatic Invertebrate Toxicity:	No data available
Aquatic Plant Toxicity:	No data available
Avian Toxicity:	No data available
Honeybee Toxicity:	No data available

ENVIRONMENTAL EFFECTS:

Persistence and Degradability:	No data available
Bioaccumulation:	No data available
Mobility:	No data available
Other Adverse Effects:	No data available

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal: **Refer to the pesticide label for full information on disposal.** Pesticide wastes are toxic. Improper disposal of unused pesticide, spray mixture, or rinse water is a violation of Federal law. If these wastes cannot be used according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance in proper disposal methods.

Container Disposal: **Refer to the pesticide label for full information on disposal.** When possible, triple rinse the container and offer for recycling if available.

RCRA Characteristics: It is the responsibility of the individual disposing of this product to determine the RCRA classification and hazard status of the waste.

SECTION 14: TRANSPORTATION INFORMATION

DOT (Ground): Not regulated

IMDG (Sea): UN3077, Environmentally hazardous substance, solid, n.o.s. (Dithiopyr), 9, PGIII, Marine Pollutant

IATA (Air): UN3077, Environmentally hazardous substance, solid, n.o.s. (Dithiopyr), 9, PGIII, Marine Pollutant

Safety Data Sheets - SDS

Dithiopyr 40 WSB – a pre-emergent herbicide

Mayfield Athletic Fields

SECTION 11: TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Eye contact, Skin contact, Inhalation, Ingestion
Symptoms of Exposure: Mild eye and/or skin irritation.
Oral LD_{50}: 4,991 mg/kg (Estimated based upon component data)
Dermal LD_{50}: 3,415 mg/kg (Estimated based upon component data)
Inhalation LC_{50}: >5.0 mg/L (4-hour)(Estimated based upon component data)
Eye Irritation/Damage: Not anticipated to cause more than mild mechanical irritation based upon component data.
Skin Corrosion/Irritation: Not anticipated to cause more than mild skin irritation based upon component data.
Skin Sensitization: Non-sensitizer, based upon component data.

Chronic/Subchronic Toxicity: No data available
Mutagenicity: No data available
Reproductive Toxicity: No data available
Neurotoxicity: No data available
Target Organs: In animals, dithiopyr has been reported to effect the liver, kidney, adrenal gland, thyroid, gall bladder and blood.
Aspiration Hazard: Not anticipated to be an aspiration hazard.
Carcinogenicity: See below.

Chemical Name	ACGIH	IARC	NTP	OSHA
No components listed				

Dithiopyr 40 WSB – a pre-emergent herbicide

Mayfield Athletic Fields

Quali-Pro Dithiopyr 40 WSB

Revision Date: C

SECTION 11: TOXICOLOGICAL INFORMATION	
Likely Routes of Exposure:	Eye contact, Skin contact, Inhalation, Ingestion
Symptoms of Exposure:	Mild eye and/or skin irritation.
Oral LD_{50}:	4,991 mg/kg (Estimated based upon component data)
Dermal LD_{50}:	3,415 mg/kg (Estimated based upon component data)
Inhalation LC_{50}:	>5.0 mg/L (4-hour)(Estimated based upon component data)

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL HAZARDS: This product is toxic to fish and highly toxic to other aquatic organisms including oysters and shrimp. Use with care when applying to turf areas adjacent to any body of water. Drift and runoff from treated turf may adversely affect aquatic organisms in adjacent aquatic sites. Do not apply directly to water or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not apply when weather conditions favor drift from treated areas. Do not contaminate water when disposing of equipment washwaters

Dithiopyr 40 WSB – a pre-emergent herbicide

Mayfield Athletic Fields

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY/IRRITATION STUDIES:

Acute Oral LD50 (Rat):	>5,000 mg/kg
Acute Dermal LD50 (Rat):	>2,000 mg/kg
Acute Inhalation LC50 (Rat):	1.81 mg/L air (4-hours)
Eye Irritation (Rabbit):	Mildly Irritating
Dermal Irritation (Rabbit):	Practically Non-Irritation (Rabbit)
Dermal Sensitization (Guinea Pig):	Sensitizing (Guinea Pig)

12. ECOLOGICAL INFORMATION

SUMMARY OF EFFECTS (Prodiamine): Highly toxic to fish and invertebrates. Practically non-toxic to birds and bees.

Prodimine 65 – a pre-emergent herbicide

Quali-Pro Dithiopyr 40 WSB

SECTION 11: TOXICOLOGICAL INFORMATION

Likely Routes of Exposure:	Eye contact, Skin contact, Inhalat
Symptoms of Exposure:	Mild eye and/or skin irritation.
Oral LD_{50}:	4,991 mg/kg (Estimated based up
Dermal LD_{50}:	3,415 mg/kg (Estimated based up
Inhalation LC_{50}:	>5.0 mg/L (4-hour)(Estimated ba

Cadmium sulfide	7,080 mg/kg
Ethanol	7,060 mg/kg
Melamine	6,000 mg/kg
Methanol	5,628 mg/kg
Citric Acid	5,040 mg/kg
Fructose	4,000 mg/kg
Sodium chloride	3,000 mg/kg

Quali-Pro® Prodiamine 65 WDG

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY/IRRITATION STUDIES:

Acute Oral LD50 (Rat):	>5,000 mg/kg
Acute Dermal LD50 (Rat):	>2,000 mg/kg
Acute Inhalation LC50 (Rat):	1.81 mg/L air (4-hours)
Eye Irritation (Rabbit):	Mildly Irritating
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Dermal Sensitization (Guinea Pig):	Sensitizing (Guinea Pig)

Cadmium sulfide	7,080 mg/kg
Ethanol	7,060 mg/kg
Melamine	6,000 mg/kg
Methanol	5,628 mg/kg
Citric Acid	5,040 mg/kg
Fructose	4,000 mg/kg
Sodium chloride	3,000 mg/kg

Prodimine 65 – a pre-emergent herbicide

Mayfield Athletic Fields

Commercially available at Home Depot
For application to Residential Property
By the Property Owner

Mayfield Athletic Fields

Commercially available at Home Depot

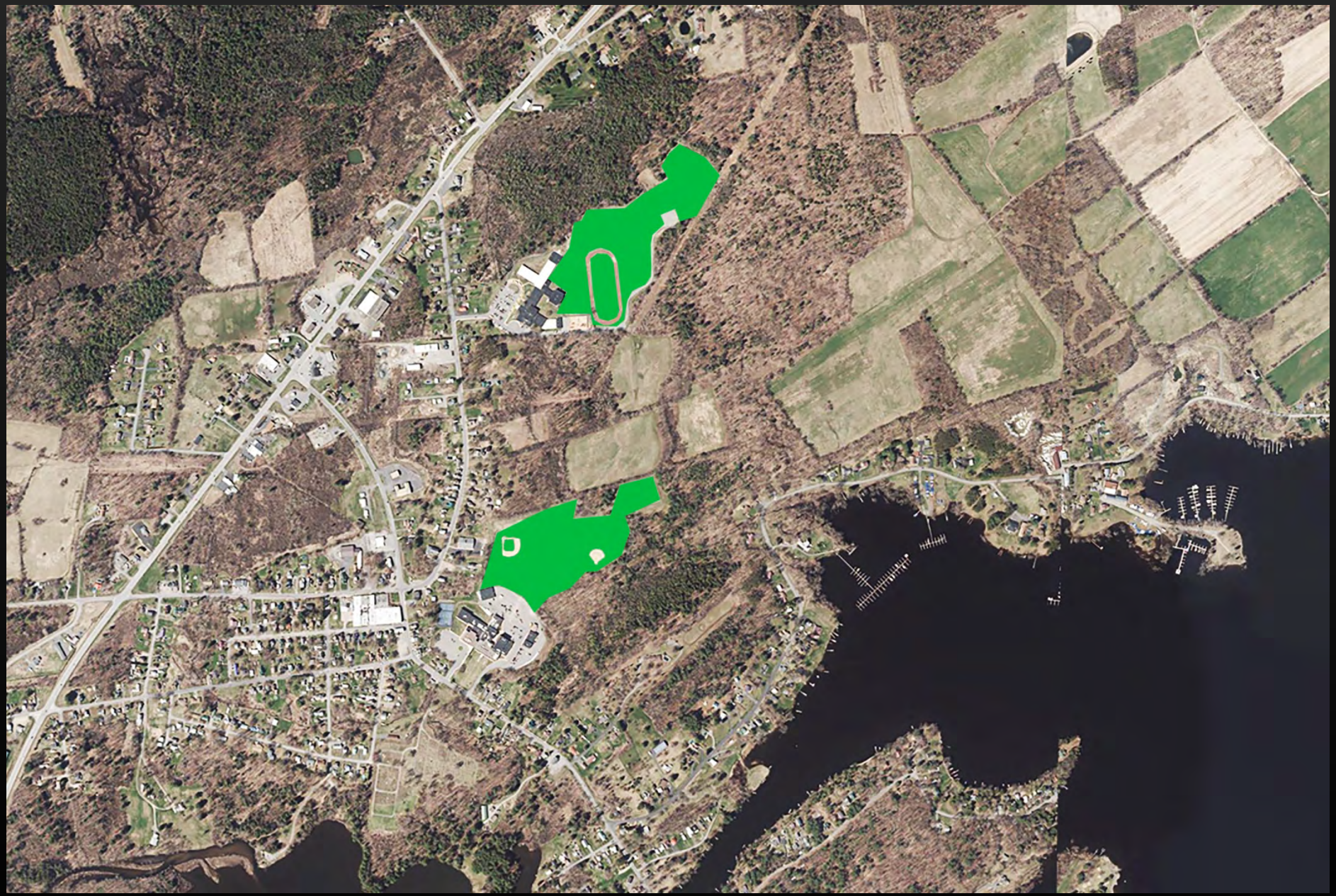
2,4-D	LD50 = 375 mg/kg	Sulfentrazone	LD50 = 2,689 mg/kg
Mecoprop-P	LD50 = 650 mg/kg	Pendimenthalin	LD50 > 4,000 mg/kg
Dicambra	LD50 = 2,000 mg/kg	Dithiopyr	LD50 = 4,991 mg/kg

Mayfield Athletic Fields

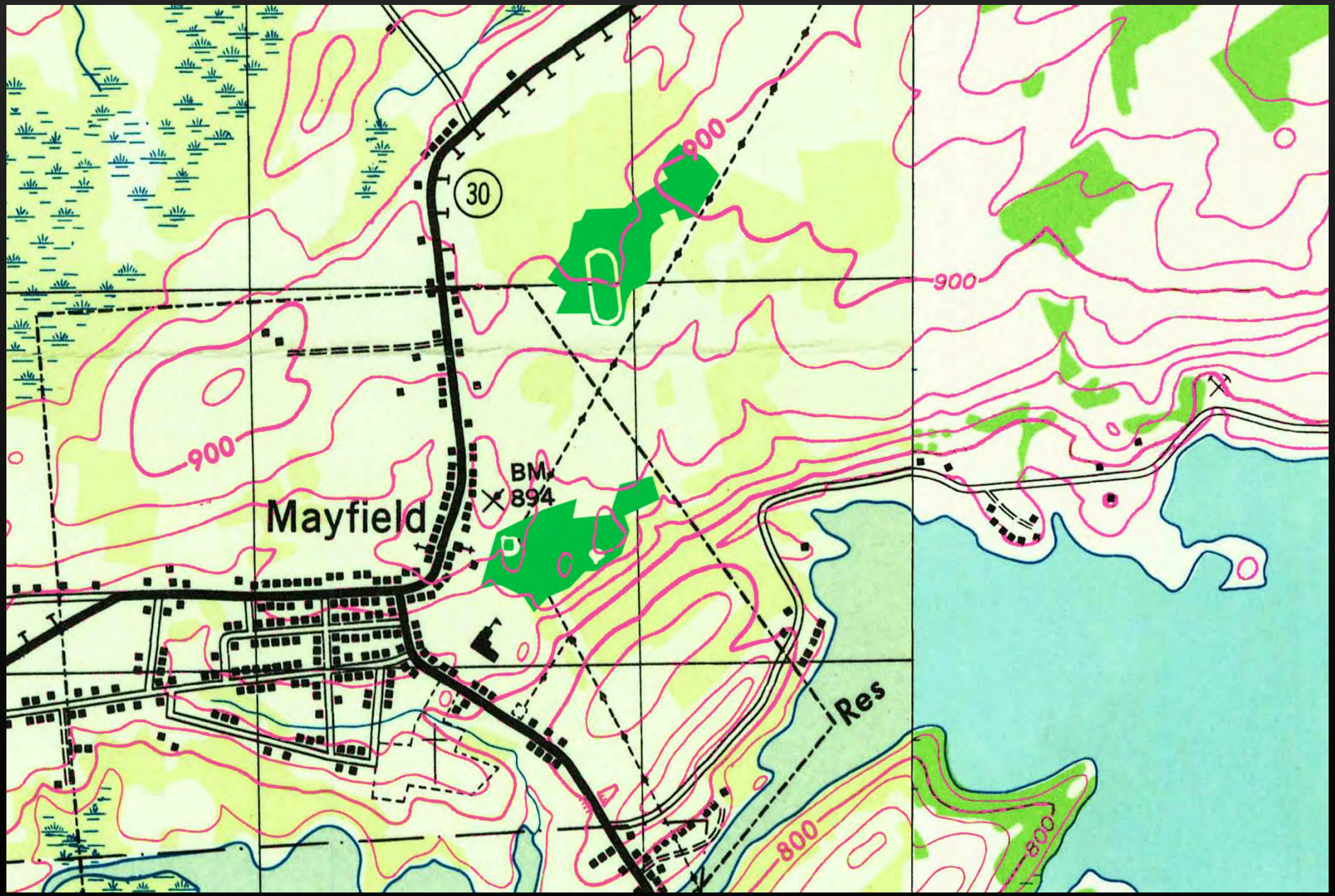
Environmental Hazards:

Dithiopyr:
This product is toxic to fish and highly toxic to other aquatic organisms. . .
Do not apply directly to water or to areas where surface water is present

Prodiamine:
Highly toxic to fish and invertebrates. Practically non-toxic to birds and bees.



Mayfield Athletic Fields



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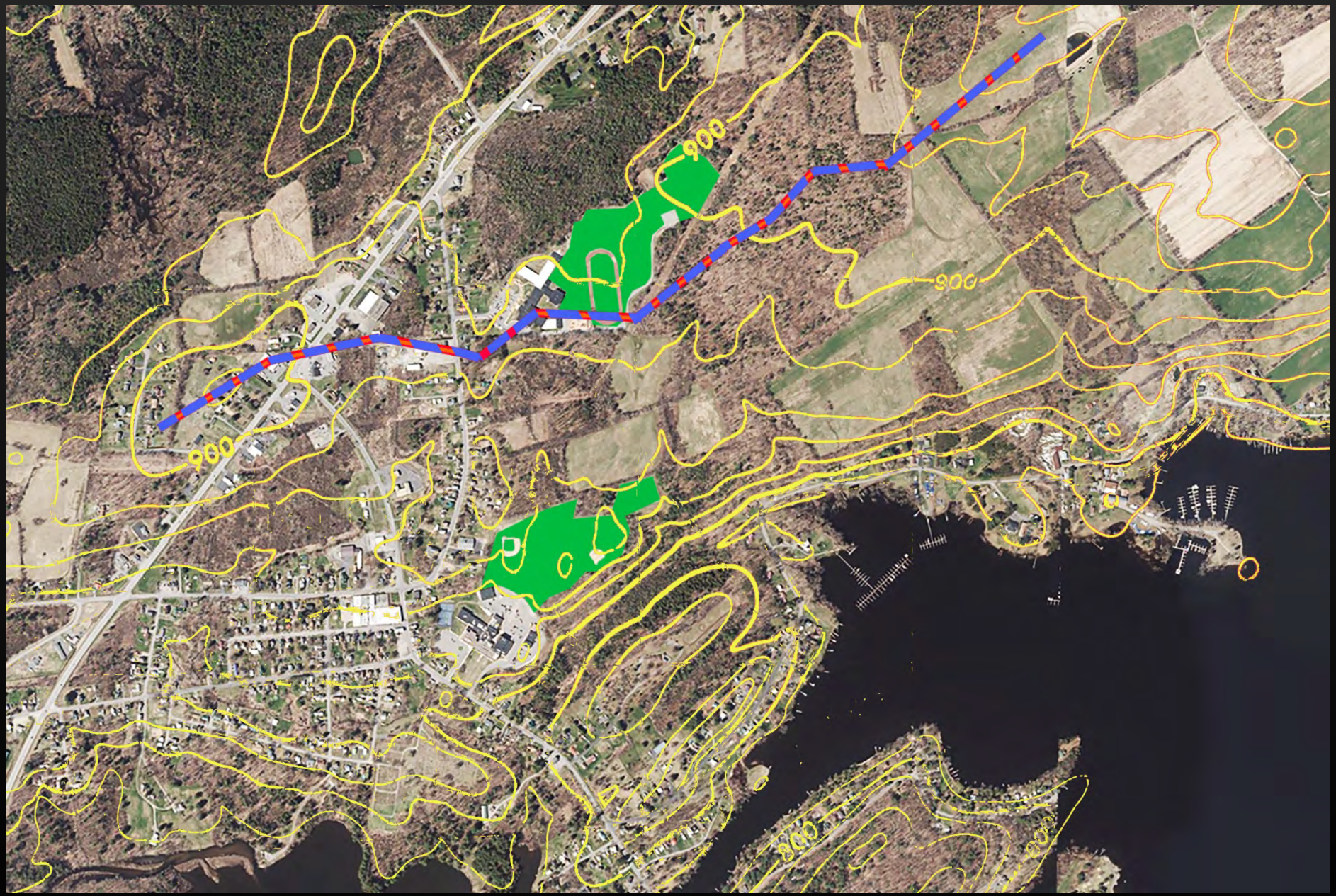

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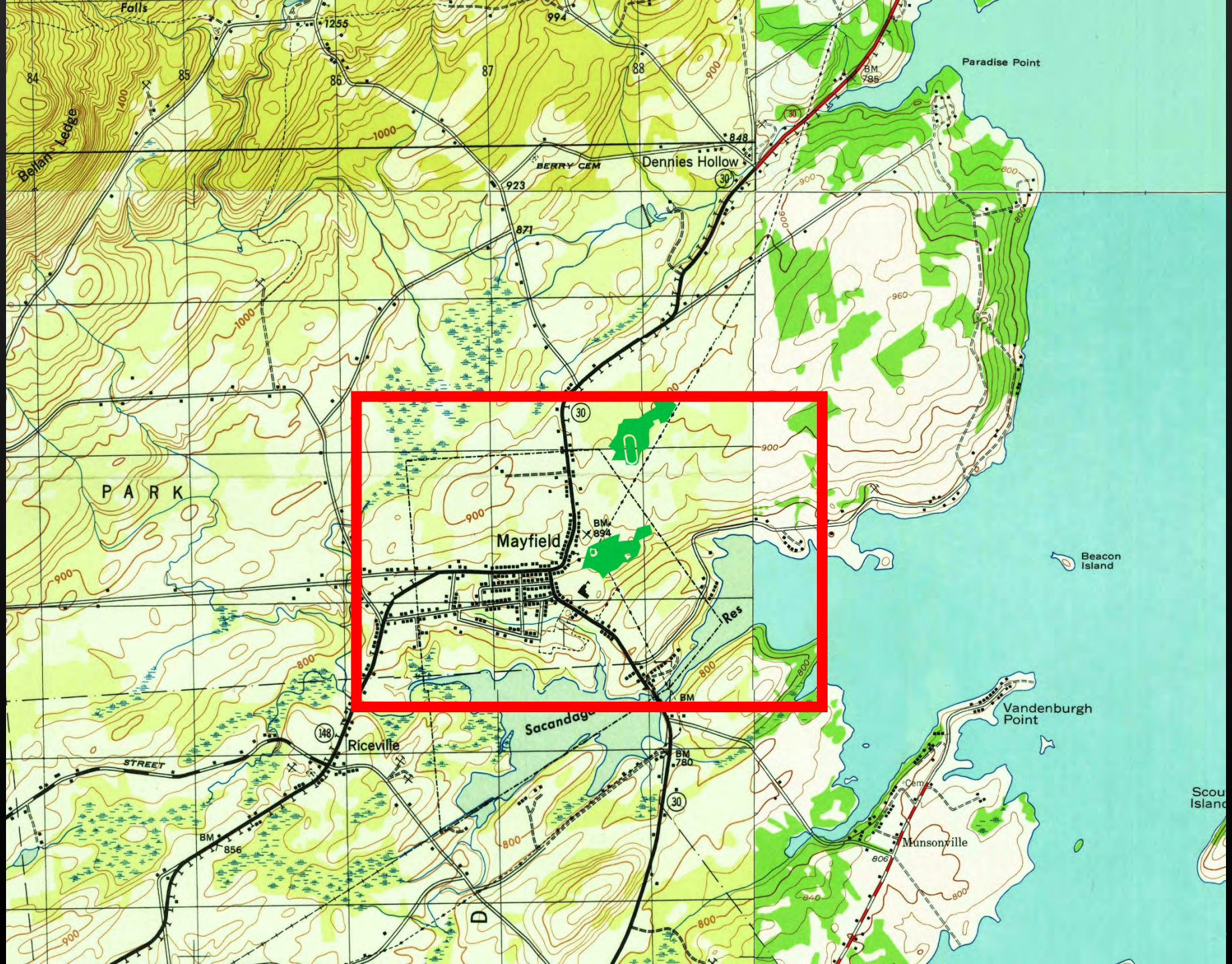
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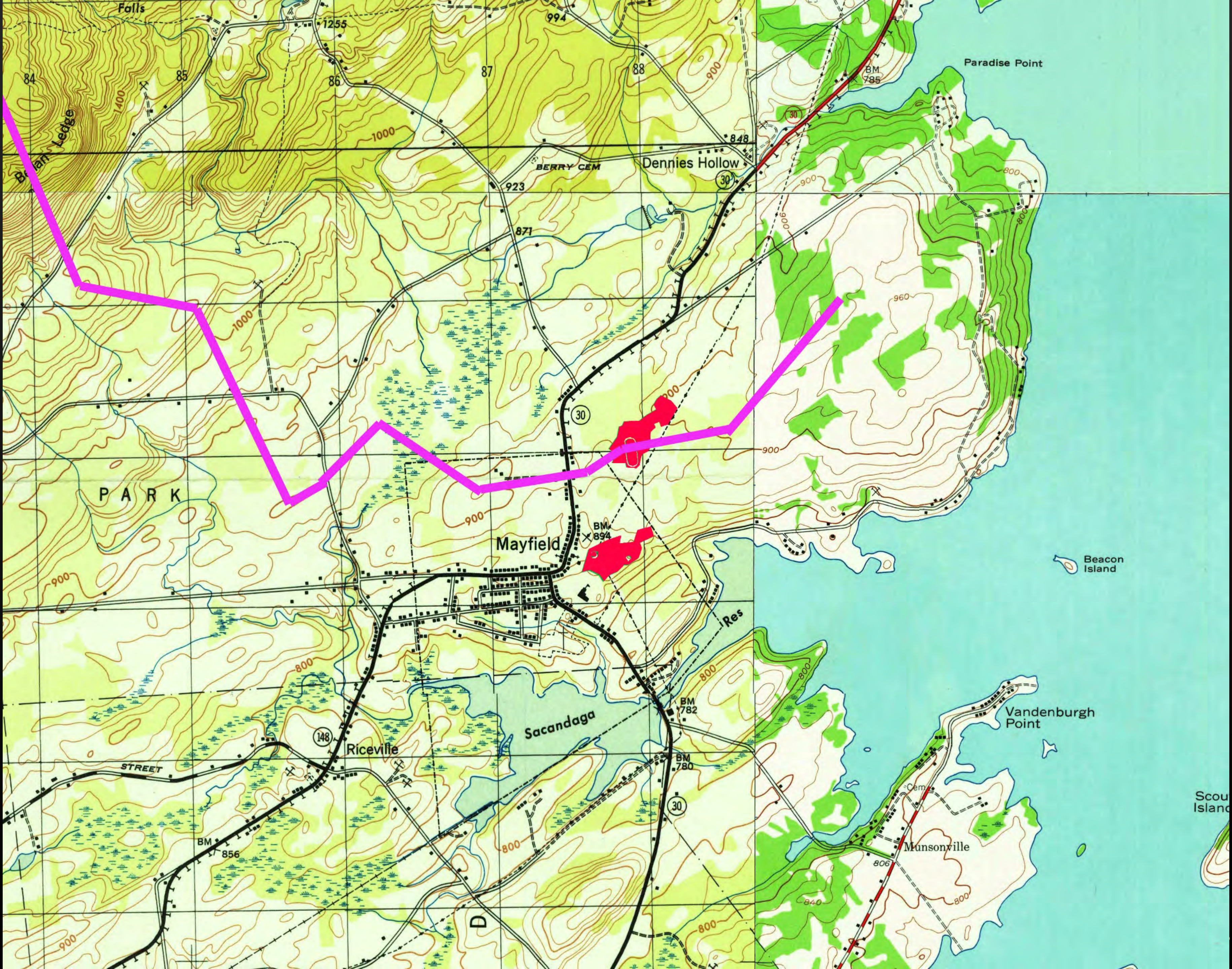

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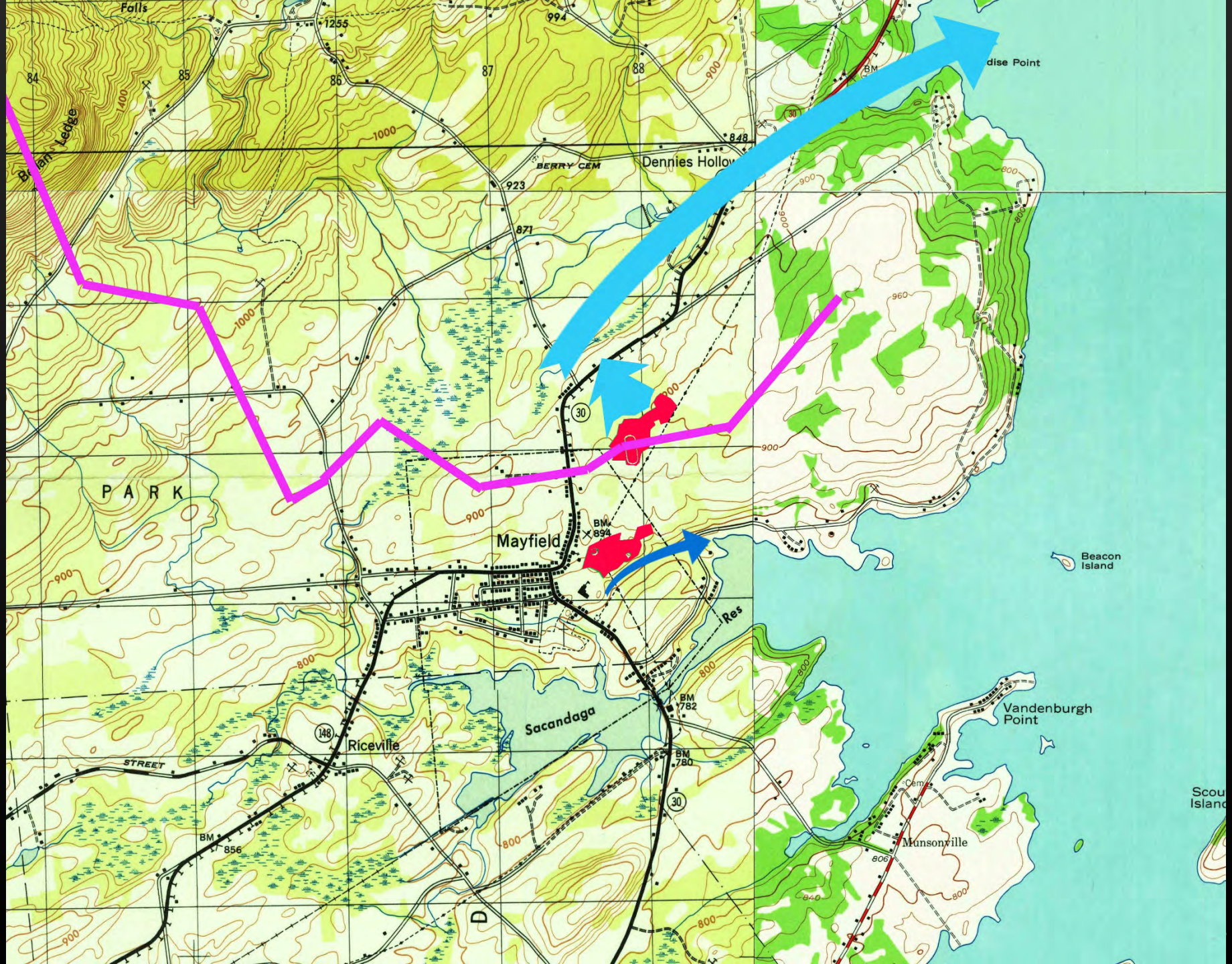
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Risk assessment is the process where we:

Identify the Hazard

Perform Risk Analysis / Risk Evaluation

Perform Risk Control

Goals:

1. Discuss relative risks of herbicide controls
2. Discuss how to evaluate risks of chemical herbicide controls when compared to other chemicals.
3. Reach an informed decision on relative merits of using chemical controls vs. student athlete injury.
4. Consider a program of chemical treatments in 2019 and future years.

REMEMBER

Pesticide means:

(1) any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any insects, rodents, fungi, weeds, or other forms of plant or animal life or viruses, except viruses on or in living humans/or other animals, which the department shall declare to be a pest . . .

6 CRR – NY 326 1 NY – CRR, Title 6, Chapter IV, Subchapter A. Pesticide Control, Part 325. Application of Pesticides, 325.1 Definitions

Pesticides include:

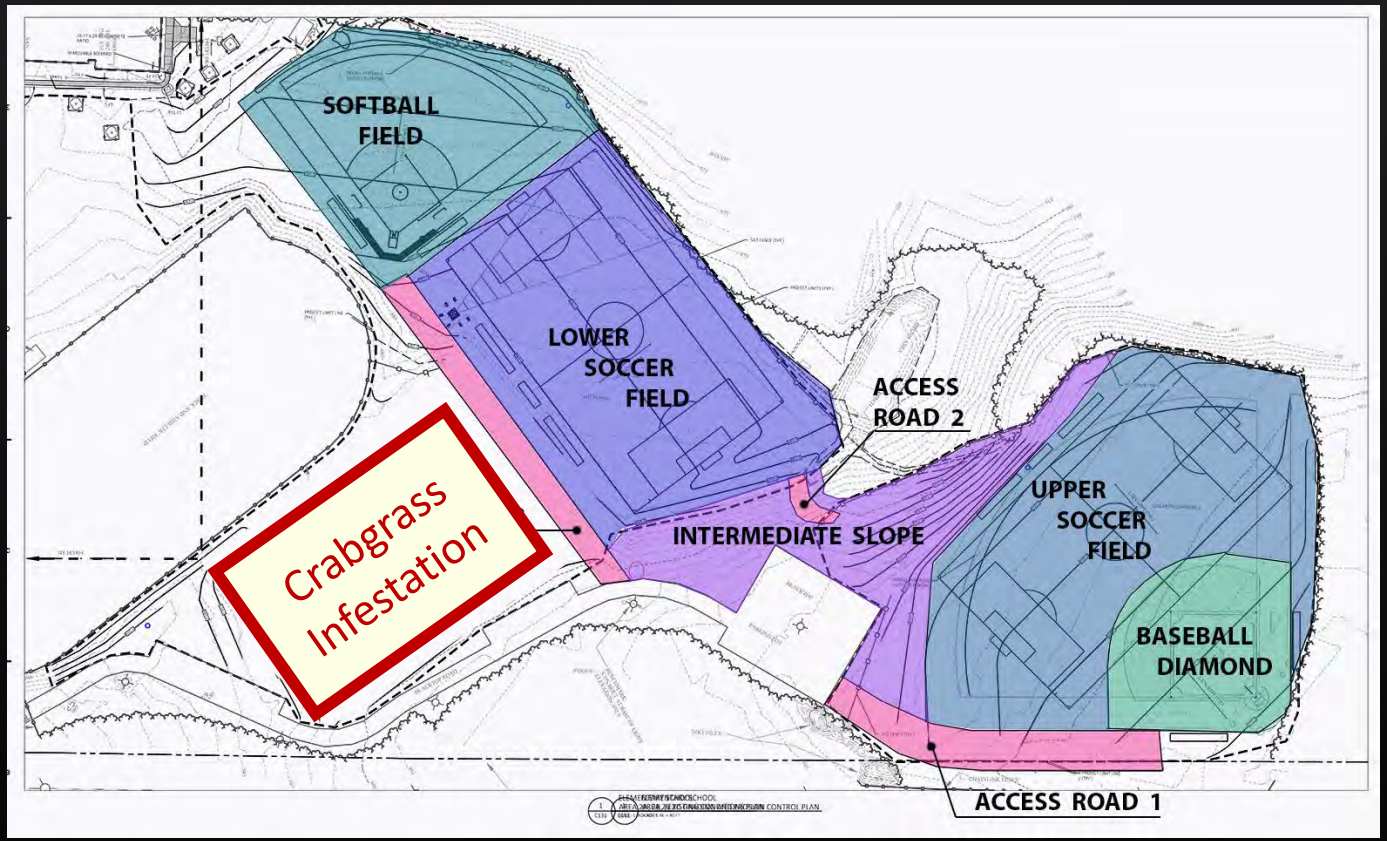
- Insecticides
- Rodenticides
- Fungicides
- Herbicides

Integrated pest management (IPM) means a systematic approach to managing pests which focuses on long-term prevention or suppression with minimal impact on human health, the environment and nontarget organisms. IPM incorporates all reasonable measures to prevent pest problems by properly identifying pests, monitoring population dynamics, and utilizing cultural, physical, biological or chemical pest population control methods to reduce pests to acceptable levels.

6 CRR – NY 326 1 NY – CRR, Title 6, Chapter IV, Subchapter A. Pesticide Control, Part 325. Application of Pesticides, 325.1 Definitions

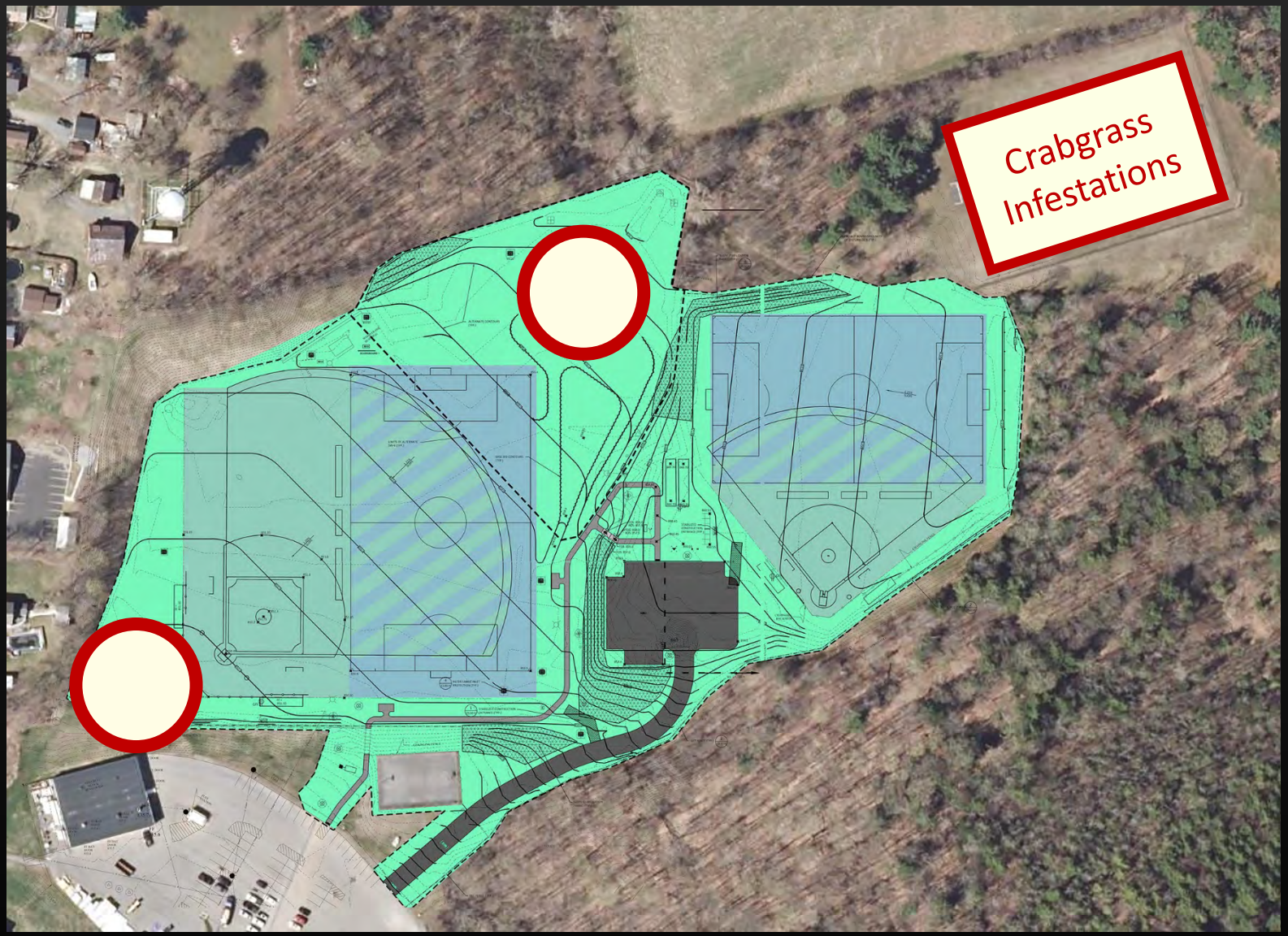
The Case for Pre-emergent Herbicides

- Soccer is a high- to moderate-intensity contact/collision sport.
- Soccer has a higher injury rate than many other sports.
- Poor turf conditions contribute to injury rates.
- Risk of injury > chemical risk to student athletes



Elementary School Athletic Fields 2016 - 2018

Mayfield Athletic Fields



High School Athletic Fields 2018 - 2019

Mayfield Athletic Fields

Mayfield IPM

1. Develop a long-term, systematic approach to maintenance
2. Allow the contractor to apply Dithiopyr and/or Prodiamine spring and summer 2019
3. Provide the contractor with a supplemental source of irrigation water
4. Re-seed with turf grass species in late summer 2019
5. Monitor seeding success and density of turf. Identify areas of bare soil.
6. Keep people off the fields until spring 2020
7. Evaluate effectiveness of pre-emergent weed controls.
8. Follow-on application of corn gluten meal and NPK fertilizer
9. Practice vigilance in monitoring weed species
10. Aggressively eradicate adjacent weed seed banks.
11. Develop a long-term, systematic approach to maintenance