

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF ADMINISTRATIVE LAW APPEALS

April 12, 2005

In the Matter of

MARTHA JEAN EAKIN.

Docket No. 2002-013
Determination of Applicability
Landowner: McLean Hospital Corporation,
Inc.
Property: 115 Mill Street
Belmont

2005 APR 19 AM 11: 07

COMMUNITY
DEVELOPMENT

RECOMMENDED FINAL DECISION

DETERMINATION OF APPLICABILITY - appeal from a superseding determination of applicability that found a stream to be intermittent and therefore not a river. After a hearing, the superseding determination is affirmed based on observations that the stream has run dry. See 310 CMR 10.58 (2).

Adam Brodsky, Esq., Hingham, for petitioners Martha Eakin, Joan Wissmann, and a ten residents group.

Stephen W. Kidder, Esq., and Dianne Tillotson, Esq. (Hemenway & Barnes), Boston, for landowner McLean Hospital Corporation.

Elizabeth Kimball, Esq., Boston, for the Department of Environmental Protection.

JAMES P. ROONEY, Administrative Magistrate

Introduction

This wetlands appeal involves a dispute over whether 600 feet of a small stream on the grounds of McLean Hospital is perennial or intermittent, and thus whether it is a river subject to protection under the Rivers Protection Act. The case is decided under the approach the

Department of Environmental Protection (DEP) promulgated in 1997 to resolve such questions.¹ After a hearing, I conclude that although the stream section runs perennially during some years, it is intermittent in others when there is no extended drought and therefore is not a perennial stream or a river. It is not an intermittent stream either, because it is upgradient of all bogs, swamps, wet meadows, and marshes. I therefore affirm DEP's superseding determination of applicability.

Background

Junction Brook, which is the subject of this determination, is located on the 238 acre campus of McLean Hospital, a mental health hospital in Belmont. The site is a large wooded hill with the hospital buildings spread out at the top. Maps dating from the late nineteenth century, when hospital construction began, show an unnamed stream in the present location of Junction Brook, flowing down a steep slope southward toward Pleasant Street. At the time, a three acre wetland existed on the hilltop immediately to the north of where Junction Brook began to flow down the hill. There was also an active spring just to the north of the wetland. To all appearances, these were the headwaters that fed the brook.

Since that time, this area has been drastically altered. The wetland and the spring are no more. The wetland was filled in the 1930s to create a tennis court, which was later replaced in the 1960s by a parking lot for one of the hospital buildings, Higginson House. The hospital used the spring as a water source for a time. In 1939, it started purchasing municipal water from

¹ The method discussed in this decision for resolving whether a stream is intermittent or perennial is the one set forth in the Wetlands Protection Regulations effective October 7, 1997. DEP substantially revised its approach in Regulations it issued on December 20, 2002. The revised Regulations do not apply to a request for determination, such as this one, that was filed before December 20, 2002. See 310 CMR 10.10(11)(rev. December 20, 2002). I refer throughout this decision to the 1997 version of the Regulations, unless noted otherwise.

Belmont. Although the record is not entirely clear, it may have continued to use the spring for awhile thereafter as a source of water for fire suppression, but that use ceased more than twenty years ago. Where the spring once was is now a well topped by a manhole. The water in this well no longer springs.

Today, Junction Brook begins on a hillside just below a hospital roadway known as Main Road. It is 800 feet long and descends 110 feet during its run. Water flowing in the brook comes from natural sources -- storm water runoff and groundwater -- but it is not conveyed naturally to the brook. Rather, two storm drainage pipes protruding from the side of the hill provide the brook's water. The water first flows into a sizeable pool with rocks at its bottom. From there, the brook descends steeply through sharply cut banks until it reaches the bottom of the hill. There the brook flattens out and its banks become less defined. During the course of its descent, flow in the brook decreases. One reason for this is that the stream is a "losing stream." During its run the streambed is above groundwater level; water flows through the streambed into the groundwater rather than vice versa. Finally, the brook enters a culvert under Pleasant Street. The culverted stream flows in a generally easterly direction until it eventually joins Wellington Brook, a perennial stream.

Interest in Junction Brook has increased since McLean announced plans to redevelop portions of the site, including, according to petitioner Suzanne Bass, the construction of a senior living center near the top of Junction Brook. Both McLean and petitioners requested, as the Wetlands Protection Regulations allow them to do, that the Belmont Conservation Commission (and then DEP) determine whether the stream is perennial or intermittent and, thus, the extent of jurisdiction to regulate work on the site under the Wetlands Protection Act, M.G. L. c. 131, § 40.

If a stream is perennial, it generally has a 200 foot wide riverfront area on either side of it; if it is intermittent, it has no such riverfront area. See 310 CMR 10.58(2)(a). The parties' many submissions imply that the presence of riverfront area adjacent to Junction Brook will have an impact on the proposed development. Because the plans for the senior center are not in the record, however, the nature of this impact is not certain.

McLean acted first. In 1997, it asked the Belmont Conservation Commission to determine that Junction Brook is intermittent. The Commission did so, based on evidence that the brook did not flow at the bottom of the hill in July 1997. The determination was valid for three years and expired in 2000. See 310 CMR 10.05(3)(b)1.

In March, 2001, Martha Eakin, a Belmont resident who owns land abutting McLean, sought a determination that the brook is perennial. The Commission once again concluded that the stream is intermittent. It found that the watershed of the brook is only six acres, far smaller than the three mile watershed the 1997 Regulations then provided was the likely minimum watershed of a perennial stream. It also found that this particular intermittent stream (or rather any wetland resource areas potentially associated with the stream, such as land under a water body and bank), was not protected under the Wetlands Protection Regulations. Under the Regulations, an intermittent stream is a stream "except for that portion upgradient of all bogs, swamps, wet meadows and marshes," all of which are types of bordering vegetated wetlands. 310 CMR 10.04. The Commission found no bordering vegetated wetlands adjacent to the brook. It noted that the "groundwater regime in the altered wetlands [the filled wetlands that are now a parking lot] continues to drive aquifer flow," meaning that groundwater is the source of the brook's water, but that the land under the parking lot is no longer a wetland protected under the

Wetlands Protection Act, M.G.L. c. 131, § 40. Having concluded that Junction Brook is upstream of all wetlands, the Commission “reluctantly” found that Junction Brook contained no protected wetland resource areas.²

²The Commission expressed some confusion about an earlier decision of mine, Matter of Phillip Rice, Trustee, Bradford Circle Trust, Docket No. 99-034, Final Decision, 7 DEPR 117 (September 13, 2000). The Wetlands Protection Regulations provide that when an issuing authority, be it a conservation commission or DEP, is to decide whether a stream is intermittent or perennial, it must first look at the information provided about the stream by U. S. Geological Survey maps. If the latest U.S.G.S. map shows the stream as perennial, the issuing authority must presume the stream is perennial until such time as evidence from a competent source is presented to the contrary. 310 CMR 10.58(2)(a)1.a and 310 CMR 10.58(2)(a)1.a.ii. The Regulations similarly require that if the U.S.G.S. map shows the stream as intermittent or does not show it at all, the issuing authority shall treat it as intermittent until competent contrary evidence is presented. 310 CMR 10.58(2)(a)1.a.i. In this latter instance, the Regulations do not use the word presumption. In Matter of Rice, I did use the word presumption to describe how an issuing authority is to treat the situation when a U.S.G.S. map shows a stream as intermittent or does not show it at all. 7 DEPR at 121. The Commission believes that the Rice decision raises the bar on those who would challenge the initial assumption that a stream is intermittent based on a U.S.G.S. map. In its decision, it stated, “the Commission will not elevate the importance of the [U.S.G.S.] map to a *presumption* of an intermittent stream.”

To clarify, Matter of Rice does not change the standard set forth in the Regulations. The Regulations simply require that an issuing authority begin its analysis of a stream’s status by looking first at the U.S.G.S. map. While the Regulations use the word “presumption” when the U.S.G.S. map shows a stream as perennial and do not use that word when the map shows otherwise, these two situations are exactly parallel and the standard is the same under either of them. In each instance, the issuing authority starts with the U.S.G.S. map and then moves on if evidence is presented that contradicts the map.

The word “presumption” in this context has no talismanic force. What the Regulations describe in both instances, whether they use the word or not, is a rebuttable presumption. In American jurisprudence, a rebuttable presumption means only that a fact finder under specified circumstances is to presume a certain fact is true even though no evidence has been presented to establish that fact or, more relevant here, when only one piece of evidence – the U.S.G.S. map – has been presented. See, e.g., Jacobs v. Town Clerk of Arlington, 402 Mass. 824, 827, 525 N.E. 2d 658, 660 (1988)(person missing for seven years presumed dead). Because the presumption is rebuttable, once any other relevant, material evidence has been presented, the presumption goes away and the fact finder must then analyze the facts actually presented to determine what fact has been proved. Jacobs, 402 Mass. at 828, 525 N.E.2d at 661(the “presumption of death in this case ... disappeared when controverting evidence appeared”).

In this instance, that is exactly what the Commission did. It examined the U.S.G.S. map for the area and noted that the map did not show Junction Brook at all. It therefore started by treating Junction Brook as intermittent until evidence was produced that it is perennial. When that evidence was presented, the Commission analyzed it and made a finding based on the facts presented to it. The U.S.G.S. map was one of those facts, but once the presumption had gone away, the Commission need not have given the map any more weight than it deserved. Here, the Commission found that the map deserved little weight. It failed to show Junction Brook, although maps at least one century old showed it. It also failed to treat Wellington Brook as perennial, although the Commission had already found it to be so.

Eakin and 19 other Belmont residents asked DEP to supersede the Commission's determination and find that the brook is perennial. DEP, too, determined that the brook is intermittent, and therefore not a river, based on its small watershed and observations by McLean employees of no stream flow at the bottom of the hill. Eakin sought to counter these observations by claiming that groundwater is infiltrating into the hospital sewer system, particularly a sewer line that parallels the stream, and diverting water from the stream causing it to dry up at the bottom of the hill. DEP was not convinced such interception of groundwater affected streamflow and concluded that, in any event, this was not a factor to be considered when evaluating whether a stream is perennial. See 310 CMR 10.58(2)(a)1.c. Finally, DEP determined, as had the Commission, that Junction Brook is not a stream subject to regulation under the Wetlands Protection Act because its source is not a wetland and it does not flow through a wetland.

Eakin and Joan Wissmann, another abutter, appealed, as did a ten residents group made up of Eakin and other Belmont residents, and the Belmont Citizens Forum, which later withdrew. Administrative Law Judge (now Administrative Magistrate) Mark Silverstein held a prehearing conference and established as issues to be adjudicated whether Junction Brook is intermittent or perennial and whether there are any bordering vegetated wetlands associated with it. In a later conference call, petitioners' counsel informed me that petitioners were no longer pursuing a claim that the brook has bordering vegetated wetlands associated with it.

McLean moved for summary decision on the one remaining issue -- whether Junction Brook is perennial. It argued that the undisputed facts show the brook to be intermittent. It relied on observations by its own witnesses and those made by several of petitioners' witnesses

that streamflow ceases at times during the summer at the bottom of the hill. Petitioners opposed the motion, arguing that the brook should be considered perennial because its flow is reduced by groundwater infiltrating into the hospital's sewer system.

The Wetlands Protection Regulations acknowledge that human actions can cause what would otherwise be a perennial stream to cease flowing. They do not require, however, that issuing authorities sort out the impact of all human activities on a stream before determining whether it is perennial or intermittent. Rather, they provide that a stream that is "perennial under natural conditions but affected by drawdown from water supply wells or direct withdrawals shall be considered perennial." 310 CMR 10.58(2)(a)1.c. In ruling on the summary decision motion, I concluded that any passive infiltration of groundwater into McLean's sewer system was neither a drawdown of water by a water supply well nor the direct, active extraction of water from a water source. Therefore, the impact of the sewer system on Junction Brook was irrelevant to determining whether the brook is perennial. Partial Summary Decision, 10 DEPR 93, 95-96 (May 2, 2003).

As a consequence, the observations that Junction Brook at its Pleasant Street end had gone dry could not be discounted and therefore at least the lower portion of Junction Brook was intermittent. But did that mean that the entire brook was intermittent? No evidence had been presented that the upper portion of the brook runs dry. The only evidence was that the brook loses flow as it proceeds downhill. Therefore, the possibility existed that the stream flowed perennially at its head but intermittently by the time it reached the bottom of the hill. I concluded that the Regulations contemplated the possibility that a perennial stream was not necessarily perennial for its entire length. 10 DEPR at 97. I therefore scheduled a hearing to consider

whether the upper portion of Junction Brook is perennial and, if so, where the boundary lies between the intermittent and perennial sections of the brook.³

Prior to the hearing, the parties stipulated that “[t]he stream has been observed dry for a distance of 200 feet above (north of) the Pleasant Street headwall. . . . There are no recorded observations of the stream dry between Main Road and the point that is approximately 200 feet north of or above Pleasant Street, *i.e.*, the first 600 feet of the stream.”

At the hearing on September 18 and 19, 2003, the witnesses testifying for petitioners were Suzanne Bass, a vice president of the Belmont Citizens Forum, long time Belmont residents Sumner Brown, Murray Ruben, Nancy Davis, Barbara Passero, and petitioner Martha Eakin, Roger Wrubel, the director of Audubon’s Habitat Wildlife Sanctuary in Belmont, and Denis D’Amore, a professional engineer with a Ph.D. in geology.

Testifying for McLean were three of its employees, Andrew Healy, its Director of Facilities, Thomas Gallagher, who works in its Buildings and Grounds Department and was formerly a private security guard at the site, and Alexander MacPherson, a mechanic and equipment operator. Glen Clancy, the Belmont Conservation Commission management liaison, and Francis DiPietro, a professional engineer and project manager at the engineering firm of

³ I reached the same conclusion that a perennial stream could have intermittent sections in Matter of Winter, Docket No. 2002-010, Recommended Final Decision, 10 DEPR 104 (May 15, 2003). The Commissioner accepted my regulatory analysis, but cautioned that the situation in which a stream is perennial, then intermittent, then perennial again “will occur only in unusual or abnormal circumstances.” Final Decision, 10 DEPR 181 (August 11, 2003).

The stream in Winter is a substantial perennial stream for miles, but the geology of its streambed changes and it begins to lose water, so much so that it occasionally dries up although continuing to flow upstream. Junction Brook is also a water-losing stream, but the cases do not present the same question. In Winter, I found that the portion of the stream that is a losing stream is intermittent. Here, in contrast, petitioners argue that Junction Brook, although it is a losing stream, is nonetheless perennial.

Vanasse Hangen Brustlin, Inc. also testified for McLean.

Environmental analyst Rachel Freed testified for DEP.

At the parties' request, I viewed the site on October 7, 2003.

Discussion

I. Perennial Stream Evaluation

A "river" is defined in the Rivers Protection Act, which in 1996 amended the Wetlands Protection Act, and in the Wetlands Protection Regulations as a "natural flowing body of water that empties into any ocean, lake, or other river and which flows throughout the year." M.G.L. c. 131, § 40, ¶ 14 and 310 CMR 10.58(2)(a)1. Most rivers, with a few stated exceptions, have a protected riverfront area that is the "area of land between the river's mean annual high-water line measured horizontally outward from the river and a parallel line 200 feet away." 310 CMR 10.58(2)(a)3. The perennial/intermittent distinction is critical to determining whether a stream is a river with a riverfront area. As the Wetlands Protection Regulations put it succinctly: "[p]erennial streams are rivers; intermittent streams are not rivers." 310 CMR 10.58(2)(a)1.

A. Can Junction Brook Meet the Definition of River?

1. Does it Empty into an Ocean, Lake, or Other River?

Before evaluating the evidence of perenniality, I turn first to two arguments McLean makes that might obviate the need for such an evaluation. McLean contends that, even if the upper reaches of Junction Brook flow perennially, it cannot be a perennial stream because of where the water flows next. Relying on the river definition I cited at the outset of this discussion, which provides that a river "empties" into an "ocean, lake, or other river," 310 CMR 10.58(2)(a)1, it argues that the upper portion of Junction Brook flows into the intermittent lower

portions of the brook and then into a culverted section of Wellington Brook, neither of which are an ocean, lake, or river.

I have previously addressed the argument that a perennial stream cannot, by definition, flow into a downstream intermittent section. I concluded that the word “empties” on which McLean relies, refers to the type of waterbody into which a river ultimately discharges, not to changes in the nature of the stream during the course of its run. Matter of Eakin, Partial Summary Decision, 10 DEPR at 97, and Matter of Winter, Recommended Final Decision, 10 DEPR at 109.

In this instance, the upper reaches of Junction Brook “empty,” not into the intermittent section of the brook, but ultimately into Wellington Brook. It is true that Junction Brook discharges into a culverted section of Wellington Brook and that neither the Belmont Conservation Commission nor DEP has determined Wellington Brook to be a river at this point. But the status of the culverted section of Wellington Brook is irrelevant. The Regulations provide that when “a river runs through a culvert more than 200 feet in length, the riverfront area stops at a perpendicular line at the upstream end of the culvert and resumes at the downstream end.” 310 CMR 10.58(2)(a)3. In order then to figure out into what type of waterbody Junction Brook empties, attention must turn to the downstream end of the culvert. The culvert system runs for about three quarters of one mile between the discharge point of Junction Brook and the downstream end of the culvert. There is no dispute that at the point where the culvert ends, Wellington Brook is a perennial stream. Indeed, the Belmont Conservation Commission found it to be so in other cases. Junction Brook therefore empties ultimately into a river.

2. Is Junction Brook a Natural Flowing Body of Water?

McLean's engineering witness, Francis DiPietro, made a different type of definitional argument. At the end of his testimony, he contends that Junction Brook cannot be a river because it is not a "natural flowing body of water." See 310 CNR 10.58(2)(a)1. This point was not the subject of cross-examination at the hearing or argued in the post-hearing briefs, but because it is potentially significant, I address it.

The Wetlands Protection Regulations do not define "natural." I assume DEP meant the ordinary meaning of natural, which refers to something "existing in or formed by nature (as opposed to artificial)." The Random House Dictionary of the English Language 952 (1967). But the Regulations also demonstrate that DEP is well aware that after hundreds of years of development, Massachusetts rivers do not arise in pristine wilderness. When discussing human activities that alter stream flow, the Regulations mention the impact of "withdrawals of water supply wells" and "direct withdrawals." 310 CMR 10.58(2)(a)1.c. They leave out a myriad of other human influences on water flow known to DEP, including drainage and sewer systems, impervious surfaces, and storm water control devices.

Since DEP knows that river flow is impacted by human actions, what then do the Regulations mean when they say a river is a "natural flowing body of water?" A hint comes from the description in the Regulations of the headwaters of a river: "[r]ivers begin at the point an intermittent stream becomes perennial, or at a spring or a pond which discharges throughout the year." 310 CMR 10.58(2)(a). Rivers thus begin with another "natural" water source (even if that source is influenced by human activities) and continue on as "natural" water bodies themselves.

In this instance, there is not question that at one time Junction Brook had purely natural

sources, including one of the sources mentioned in the Regulations, a spring. Its spring and wetland sources are no more, but the stormwater runoff and groundwater that used to feed the brook still do, although now conveyed by pipes. Because the source of the water flowing in Junction Brook is natural, I conclude that the river definition in the Regulations does not preclude the possibility that Junction Brook could be a river. Nonetheless, the extensive human alteration of the brook's headwaters makes the determination of its status more difficult than if its headwaters were in a more "natural" state.

B. Evaluation of the Evidence

But, turning to the evaluation of the evidence, the more immediate difficulty for the petitioners is that they start out with two strikes against them under the regulatory approach for determining perenniality. The Wetlands Protection Regulations provide that a party can attempt to demonstrate that a stream assumed to be intermittent because it is not shown on the latest U.S.G.S map for the area is in fact perennial by introducing evidence "of a stream order of two or greater" or a "watershed size of greater than three square miles." See 310 CMR 10.58(2)(a)1.a.1.⁴ Neither of these is the case here. A stream with an order of two or greater has tributaries feeding it; Junction Brook has none. Junction Brook's watershed is by one estimate only six acres. The minuscule size of this watershed convinced both DEP and the Belmont Conservation Commission that Junction Brook is not perennial.

But all is not lost for petitioners. The Regulations allow the consideration of other

⁴ Under the 2002 Regulations, DEP allows for the possibility that a stream with a watershed size of at least 0.5 square miles is perennial. One way of showing this is by demonstrating that the surficial geology of the drainage area contains 75% or more stratified drift. See 310 CMR 10.58(2)(a)1.c.ii (rev. 2002). That would be of no help to petitioners because the geology of the site is far different. As described by D'Amore, the hill on which McLean sits is bedrock covered by a thin veneer of glacial till.

relevant evidence. See 310 CMR 10.58(2)(a)1.a.i. Petitioners rely on the well-defined nature of the brook channel, an undated map of the site purportedly showing the brook as perennial, an evaluation of the groundwater that feeds the brook, and observations by a number of witnesses over a number of years in all seasons that the brook does not cease its flow. When all is said and done, despite the obstacles in their path, petitioners put on a strong case that Junction Brook is perennial, with some help from McLean. McLean introduced evidence that the watershed for the brook is 0.5 square miles, not a mere six acres, and that the brook flowed throughout 2003. Petitioners' groundwater analysis, coupled with frequent random observations by its witnesses and observations by one of McLean's witnesses in key later summer months tend to demonstrate that the brook also flowed perennially in 2002, a year in which the rainfall was typical.

1. Nature of the Stream Channel

Not all of petitioners' evidence is compelling. The nature of the brook channel was first mentioned by wetland scientist Patrick Garner in an April 12, 2001 letter to the Belmont Conservation Commission as a factor tending to demonstrate that Junction Brook is perennial. In the letter, Garner, who was working on behalf of Martha Eakin, stated that:

there is a cohesive and relatively deep flow channel throughout the stream system. Importantly, the channel itself is incised. Using Rosgen's classification⁵ for this stream, the brook is a type A3 river, characterized as a steep, deeply entrenched, and confined channel. These streams are rarely intermittent, with morphology typical of perennial conditions and strong flows.

Garner did not testify at the hearing, but petitioners' witness Denis D'Amore, an engineer and a geologist, adopted his analysis.

The Regulations place some importance on the nature of a stream channel. They provide

⁵ Neither Rosgen nor his stream classification scheme are identified further in the record.

that the “absence of a channel or banks” may be used to prove that a stream is intermittent.” See 310 CMR 10.58(2)(a)1.a.ii. By implication, the presence of a defined channel or banks may help demonstrate the opposite.

No one disputes that the upper brook channel is incised. The significance of this fact is disputed. While an incised stream channel may in many instances be evidence of flow throughout the year that creates and maintain the channel, I am not convinced that is the case here. The parties agree that groundwater provides the baseflow for Junction Brook, but they also agree that stormwater runoff provides most of the volume of flow in the brook. If the brook is perennial, it must be because groundwater provides a continuous, if small, amount of water throughout the year. The incised, deep flow channel is unlikely to have been created by this low flow, however. Rather, the higher volumes of fast moving runoff, which dissipate within one day after a storm according to DiPietro, more likely created the incised channel. And so, while an incised channel may in many instances be evidence that a stream is perennial, I do not find it to be probative here.

2. Mapping of Junction Brook

Petitioners introduced a map from the Middlesex County Atlas that is somewhat more helpful to their case. This undated map depicts Junction Brook as a solid line. According to D’Amore, the line is a solid blue line,⁶ which he says is the traditional way of depicting a perennial stream. Although the record does not contain a key from the atlas that would confirm that Middlesex County adhered to this approach, D’Amore asserts that the atlas used this approach, noting that it also depicted Wellington Brook, which is perennial, as a solid blue line.

⁶ The photocopy submitted into evidence is not in color.

Assuming that D'Amore is correct, the principal difficulty with the map is that it does not show current conditions. DiPietro estimates, based on how few McLean buildings are shown on the site, that the map dates from the early 20th century. The McLean buildings that are presently near the top of the brook, including Higginson House, are not shown on the map. Although the map does not depict wetlands, I assume from the lack of buildings in the area that the wetlands and spring that were the headwaters of Junction Brook and were depicted in late 19th century maps of the area were still in existence. If so, then what the map shows about that time period is that the wetland and the spring in their original condition provided enough water to Junction Brook to convince at least one map maker that the brook was perennial. But it is the current condition, in which the spring and the wetland no longer exist, that controls this case. At most, what the map suggests is simply the potential that the water that once fed the spring and the wetland is still there somewhere and that there may be a sufficient amount of it ending up in Junction Brook to make the brook perennial.

The situation has changed so drastically, however, as to render conclusions drawn from an old map of little use. Soil borings that an engineering firm performed for McLean in the Higginson parking lot, where the wetland used to be, show that the soil under the lot is mostly fill, and not the original wetland soils. While there is groundwater in this fill, none of the witnesses suggested that groundwater levels under the parking lot are nearly as high as they would have been in the wetland or that the manner in which groundwater from under the lot feeds the brook now is the same as it was when water from the wetland fed the brook.

The parties agreed that the water that once created the spring must have come from somewhere on the McLean site that is at a higher elevation than the spring, for it is the water

pressure created by the difference in elevation that causes water to “spring” from the ground.

D’Amore and DiPietro identified different areas on the McLean grounds as possible sources of the spring, but they agreed on the mechanism by which water must have traveled to the spring, namely through bedrock fractures. Presumably, absent some change, that water would still be flowing in the direction of the spring and would ultimately feed the brook. It is not at all evident that this is the case, however. The water level in the well where the spring once was is higher than the water level observed in a nearby catch basin,⁷ but how water enters into this well is not clear from the testimony, and by all accounts it does not spring. D’Amore testified that water transport through bedrock could have been disrupted by building construction or blasting. While the evidence does not make clear exactly what happened to the water that fed the spring, most likely there has been some, if not a considerable, disruption of such flow.

3. Groundwater Analysis

Ultimately, when trying to determine whether Junction Brook is perennial now, it is more important to examine how water flows to the brook today then to try to determine how that flow changed over time. On this score, there is considerable evidence favoring petitioners’ position. Petitioners emphasize that groundwater presently provides the baseflow for Junction Brook. This point is uncontested, but by itself does little to demonstrate that the brook is perennial rather than intermittent because, as petitioners’ witness D’Amore testified, all East Coast streams are

⁷ DiPietro asserted that the difference in water levels between the well and the catch basin demonstrates that the well is not connected to water table in the parking lot and thus provides no water to the brook. D’Amore disputed this based on a memo prepared for McLean for another purpose that discussed pipes leading away from the well. I am inclined to agree with DiPietro that the difference in water levels demonstrates that any pipes associated with the well are not taking water from it to the storm water drainage system. But I fail to see how this necessarily answers the underlying question of what happened to the water that once fed the spring.

groundwater fed. Although petitioners position is not as clear as it might be, I do not take them to be arguing that Junction Brook is perennial merely by virtue of being groundwater fed.

Rather, I understand them to be arguing that groundwater at the site provides sufficient water throughout the year to make natural perennial flow possible.

a. Sources of Groundwater Flow

To reach to Junction Brook, groundwater must enter McLean's stormwater drainage system. The drainage system drains areas of the McLean site that would otherwise generate groundwater flow toward Junction Brook. DEP and the Belmont Conservation Commission found that Junction Brook has a six acre watershed. Although neither explained how that figure was calculated, I assume it refers only to that portion of the McLean site that would drain downhill toward Junction Brook, namely the Higginson parking lot and its immediate environs. The drainage system under this lot is not independent of the rest of McLean's stormwater drainage system. Not only does groundwater from the Higginson parking lot area flow through the drainage pipes to Junction Brook, but according to DiPietro, the pipes that feed the brook drain an area of 0.5 square miles.

This is not nearly the watershed size that DEP considers the minimum necessary to support a perennial stream under normal conditions. The fact that groundwater is piped to the brook may have bearing on whether this watershed can support a perennial stream, however. Groundwater enters McLean's drainage system in as many as three ways. Underdrains located beneath the Higginson parking lot (and presumably under other hospital parking lots) are designed to draw off groundwater before it can rise, freeze, and undermine the pavement. None of the witnesses knew the exact depth that the underdrains were laid, but McLean's engineer

DiPietro estimated they were placed between two and four feet underground. He said they also must be above the storm drains so that any groundwater captured in the underdrains would flow downhill to a storm drain and be drawn off that way.

Whether the underdrains beneath the Higginson parking lot are functioning is uncertain. An earlier engineering study performed for McLean found the underdrains blocked, which DiPietro testified could have occurred naturally over time as soil accumulated in them. D'Amore questioned whether the underdrains could really be blocked, for if they were, the parking lot would flood.

Whatever the truth about the functioning of the underdrains below the Higginson lot, there is likely at least one other type of structure that regularly draws groundwater into the drainage system. DiPietro testified that typically when a building is constructed on a hillside, as those at McLean are, "footing drains" are installed on the uphill side of the building to draw off groundwater. He believes that clear groundwater drawn off by such footing drains was the source of water flowing in a catch basin that he and D'Amore observed on June 26, 2002.

Finally, there are the storm drains themselves. DiPietro testified that storm drains are not built to be as water tight as sewer lines, because if water were to enter them, it would simply drain away. He stated that water likely enters the storm drains at leaks around the pipe joints.

How then does the manner in which groundwater is piped to the brook bear on the issue of whether the brook is perennial? On the one hand, it is conceivable that groundwater levels are always above some element of the drainage system, and hence groundwater may enter the drains and the brook throughout the year. On the other hand, DiPietro testified that during the summer "the water table is below major portions of the drainage system that underlies Higginson parking

lot,” suggesting that in months when groundwater levels are lowest, the brook may be deprived of groundwater infiltration. But because the record lacks information about the exact depth of the elements of the drainage system and contains very little evidence on groundwater levels, a broad conclusion cannot be drawn easily.

b. D’Amore’s Flow Study

The most detailed information about the interaction between groundwater and the drainage system comes from a study performed by D’Amore in 2002. Between June 26 and July 30, 2002, D’Amore measured the amount of water flowing at the top and the bottom of Junction Brook on six separate days, chosen because they were not near rainy days so that the measured flow would be strictly groundwater. For the last three weeks of July 2002, he also took weekly measurements of the water table levels in a monitoring well installed in the Higginson parking lot. On June 26, 2002, water flowed at the rate of 30,000 gallons per day (gpd) at the top of the brook; that flow was reduced to 10,000 gpd by July 30. During the same period, flow at the bottom of the hill fell from 22,000 gpd to 2,400 gpd. Groundwater levels dropped only slightly, from 3.57 feet to 3.8 feet below ground. The rainfall data introduced shows that 2002 was a fairly typical year, with rainfall in the spring and summer around the overall average.

Extrapolating from the data he obtained, D’Amore predicted that the bottom of the brook would dry up by the end of August 2002, but the brook at the top would continue to flow throughout August and September. If he was right, the brook flowed at the top of the hill throughout the driest period of the year and therefore more than likely flowed throughout the whole year. And since the year was fairly typical, his analysis may predict as well that the brook flows perennially year after year.

Both McLean and DEP question the reliability of D'Amore's extrapolation. McLean objects that he relied on an extrapolation with few data points instead of measuring water flow in August and September 2002. D'Amore testified assert that he was willing to continue his work until later in the summer, but that McLean insisted the work stop when its Director of Facilities, Andrew Healy, went on vacation. In light of this, I will not consider an objection from McLean that appears to protest a problem of its own creation.

McLean also notes that in early August 2002, DiPietro saw the brook run dry at its base, contrary to D'Amore's prediction that it would not dry up until the end of the month. I agree that this calls D'Amore's extrapolation partly into question, but only regarding his estimate of when the brook would dry up at the bottom of the hill. The flow loss during July 2002 that the brook experienced between its top and its bottom varied from 7,118 to 9,679 gpd. D'Amore took the average loss and used that to predict when the brook would dry up at its base. But the data that D'Amore gathered provides no reason to believe that the stream would behave in an average fashion. The water loss over the one month period was entirely random. The amount of loss was not related to the strength of flow or to the time of the month. Thus, if on any given day an average loss were predicted, the actual loss could vary considerably from it and could cause the stream to go dry.

D'Amore's extrapolation of flow at the top of the brook does not suffer from this problem. Rather than using flow averages, he used the actual flows measured on each occasion to predict what flows would occur during the next two months. DiPietro's observations, which call into question the validity of D'Amore's predictions of flow at the bottom of the hill, help to confirm the validity of D'Amore's prediction that flow at the top of the hill would continue

unabated. DiPietro visited the site about twenty times during August and September 2002. He never saw the brook cease to flow at the top on any of these visits.

DEP criticizes D'Amore's method as unrecognized. DEP analyst Rachel Freed asked other DEP staff and members of the U.S. Geological Service if they had heard of such a method and they had not. Freed also asserts that the most reliable indicator of whether a stream is perennial is the size of its watershed.

If experts in a field have examined the reliability of a predictive method and rejected it, then I would doubtless reject it as well. But if those in the field have simply not heard of it before, that is less telling. I assume that science continues to progress and that new methods are developed frequently. That D'Amore's method is evidently new does not make it unusable. He relies on what appears to be a typical approach in mathematics and science: take data and use it to develop a mathematical curve.

The general predictive value of watershed size – one written into the Regulations – does not make D'Amore's results unworthy of consideration. Watershed size may be of great value in attempting to determine as a general matter whether a stream is perennial. But the Regulations do not treat watershed size as the only factor to be considered. Presumably, this is because streams of equal watershed size can behave differently. And in this instance, where the means by which water is conveyed from the watershed to the brook is unusual, examining the stream flow characteristics themselves may be of use. The data D'Amore acquired comes from a dry month of a typical year and provides information that is helpful in determining whether Junction Brook is perennial. Using this data, D'Amore predicted accurately that the brook would continue to flow in August and September 2002 when he was not there to observe it (but DiPietro was).

If the parties had not limited themselves to challenging D'Amore's method generally and had instead looked closely at the validity of his conclusions, they might have pursued significant substantive questions about his work. How was it that the water flow at the top of Junction Brook fell by two thirds in July 2002 and yet D'Amore concluded it would not go dry in the two dry summer months that followed? And what can be made of the minuscule drop in groundwater level? Is it proof that the groundwater level at McLean falls little during the summer and therefore that groundwater will be available for streamflow? Or is it, instead, proof that when groundwater has fallen to a certain level, even a tiny decrease in the groundwater level will cause a dramatic decrease in streamflow?

Since only the petitioners addressed the specific meaning of the data, I am left with only their analysis. Because D'Amore's data is unchallenged, his method is based on a standard mathematical approach, and no one questions the calculations he made to derive his curve, I accept that his work proves it likely that, at least in 2002, Junction Brook did not run dry during the driest months of the year. DiPietro's observations support this conclusion.

4. Streamflow Observations

Finally, petitioners rely on observations of stream flow in Junction Brook to support their case for perennial flow. These are countered by observations of no flow made by McLean's witnesses. The Regulations list observations that a stream is not flowing as one form of proof that a stream is intermittent. See 310 CMR 10.58(2)(a)1.a.ii. By implication, observations that a stream flows throughout the year would be evidence that a stream is perennial. Under the 1997 Regulations, if a stream ceases flow one day per year, it is considered intermittent, which makes proof for those attempting to demonstrate that a stream is intermittent far easier than proof the

other way. See North Shore Custom Homes, Docket No. 2000-050, Recommended Final Decision, 9 DEPR 142 (May 21, 2002), adopted by Final Decision, 10 DEPR (January 29, 2003) and Matter of Corey, Docket No. 2000-189, Recommended Final Decision (December 24, 2001), adopted by Final Decision, 9 DEPR 9 (January 11, 2002). For that reason, I will focus more on testimony regarding a lack of flow because one credible observation of no flow will prevail over frequent credible observations of flow.

Flow or the lack of it is not easily observed at the top of Junction Brook. The witnesses who made stream observations did so from two hillside paths. One path at the top of the hill runs just west of the brook before veering off into the woods and can be accessed from Main Road. The brook cannot be seen from the path itself because of the depth of the pool into which the water flows initially. Anyone wishing to see the brook must step off the path a few feet in the direction of the pool. When the brook is flowing, it can be heard from this path. The other path, which the witnesses called the "Coal Road," cuts through the woods and crosses the brook at the base of the hill. The bottom of the brook can be observed readily in a clearing there, but not the top of the brook, for the forest and other vegetation (including reportedly poison ivy) are too dense near the brook itself to permit observation for any distance uphill.

None of the witnesses made a written record of any stream observations. Despite efforts to shake them from their testimony, the witnesses for both petitioners and McLean by and large held up well under cross-examination. They all testified to specific and sometimes frequent observations of flow or no flow and each presented a credible reason to believe he or she was in a position to observe flow at the top of the brook.

Petitioners' observation witnesses (Barbara Passero, Roger Wrubel, Murray Ruben,

Martha Eakin, and William Sumner Brown) made a habit of walking, or in the case of Brown running, through the hospital grounds along paths that brought them in the vicinity of the top of the brook, and each testified credibly about personal efforts to observe flow at the top. Although no expertise is needed to observe whether a stream is flowing, some of petitioners' witnesses have special training in field work that adds credibility to their observations of the brook's flow characteristics. Passero has written educational material on the marine and coastal environment; Wrubel is director of Massachusetts Audubon's Habitat Wildlife Sanctuary in Belmont. Brown, who is an engineer, testified that on a number of occasions when he ran down the Coal Road in August and September 2001, he deliberately went to the top of the brook to see if there was any difference in flow at the top depending on whether the brook was flowing at the bottom or not. He observed no difference. Similarly, D'Amore observed the following year no relationship between stream flow at the top and the amount of water lost over the brook's run.

McLean's witnesses all work at the site. Andrew Healy, McLean's Director of Facilities, walks the hospital grounds once or twice per week, and during these walks occasionally takes the path adjacent to the top of the stream. Thomas Gallagher, who now works in the Buildings and Grounds Department, used to work for a private security firm. He patrolled the grounds when he was a security guard, including the area of Junction Brook, and on occasion searched for missing patients who might be hiding in the brook. Alexander MacPherson is an equipment operator for McLean and has, in the late summer, cleared the path adjacent to the top of the brook of fallen limbs or other debris.⁸ Sometimes this work took a few days.

⁸ Katherine Wilkie, a landscape architect with Pressley Associates, was the project manager for McLean's effort to develop a master plan for reuse of this site. One of her tasks was to map the watercourses on the site. Sometime in late July or August 1997, she saw Junction Brook run dry from

Having said that the observation witnesses for both sides were by and large credible, I am left with a conundrum for their testimony cannot be reconciled easily. It is always possible that the witnesses were looking at the brook on different days. While that is undoubtedly true for some of the observations, it cannot explain them all. If one adds up the number of visits to the brook made by the witnesses for each side, one discovers that it is possible that petitioners' witnesses visited the brook about half the days of the month and so did McLean' witnesses. There was bound to be some overlap. Healy, in particular, was adamant that the brook dried up for weeks at a time in the late summer. This testimony cannot be reconciled with petitioners' testimony by assuming Healy's observations occurred on different days.

Some of the observations occurred in different years. That explains very little, however, because most of the testimony focused on observations made in the late 1990s and the early years of this century.

the top to the bottom. She asked Healy to verify this and he saw the same thing.

I will not consider this observation here because there is evidence in the record that Belmont was experiencing an extended drought at the time. Under the Regulations, "[r]ivers include perennial streams which are dry during periods of extended drought." 310 CMR 10.58(2)(a)1.c. If Belmont had been in a period of extended drought, it would have made observations that Junction Brook ran dry – like Wilkie's – less important and potentially irrelevant. One of the things that must be shown in order to demonstrate the existence of an extended drought is "precipitation for the four previous months [that is, previous to an observation of a stream running dry] was below normal for the period of record." 310 CMR 10.58(2)(a)1.c. In one of the four months before late July and early August, precipitation in Belmont was 137% of normal. Petitioners submitted a memorandum by engineer and Commission member Kathleen Baskin to the chairman of the Commission in which she discussed the view of those who thought each month had to have below normal precipitation to count as an extended drought and the contrary view that if, on average, precipitation was below normal for the four months, the community was in an extended drought. In her memo, she relates a conversation she had with a member of DEP's wetlands staff who told her that DEP's position was to average the precipitation for the four months.

I have not been asked to decide whether there was an extended drought in Belmont eight years ago or to revisit the Conservation Commission's apparent conclusion that there was not. Given the wealth of other observation testimony in the record, there is no need to attempt to sort these matters out.

DiPietro suggested a potential solution. He testified that he visited the brook both early in the morning and toward the end of the day. He noticed that flow was different at these times; in particular, flow stopped higher up the hill on a summer day as the day wore on. He consulted with environmental scientists at his firm and was told this phenomenon was likely due to an increase in evapotranspiration as trees sucked up more groundwater during hot daylight hours. It is possible, then, that under certain conditions the brook flows at the top in the morning but ceases such flow later in the day. It is also possible that petitioners' witnesses took their walks in the morning and McLean's witnesses made their observations in the afternoon. No times were given for most of the observations, however. Therefore, I cannot determine whether the time of day influenced what the witnesses saw.

I am left then with some irreducible conflict in the evidence. The most likely conclusion is that in some years the brook flows throughout the year and in other years it does not. The careful observations made by D'Amore and DiPietro in 2002 demonstrate that the brook flowed throughout that year. Healy also testified that the brook did not cease its flow in 2003. Hence, in two recent years the brook flowed perennially.

But, I also accept the testimony of McLean's witnesses that the brook ceased to flow in 1998, 1999, and 2000. On this point, the witnesses corroborate each other, Healy testifying to lack of flow in 1998 and 1999 and Gallagher and McPherson testifying to lack of flow in 1998-2000.

Healy's description of the brook when it was not flowing makes it appear far drier than anyone else described it, but this does not undermine his testimony. It is clear from his testimony that he was close enough to the brook to see whether it was flowing. The variations in

description may simply be attributed to the vagaries of language used to describe what was observed. If the top of a rock over which one would have to walk to get close to the pool is dry, but there is some water around it, one person may describe this scenario as dry, another as wet.

Petitioners argue that McPherson's testimony that he drove heavy equipment onto the path adjacent to the brook is incredible because of the narrowness and steepness of the incline off of Main Road. They suggest that McPherson was in fact working on a broader nearby path that is a little farther from the stream. McPherson did not say, however, that he drove heavy equipment directly off of Main Road to get to the path closest to the brook, and how he got the equipment to the work site or how close that was to the stream is of no great importance. What is important is that he was working close by the stream for many hours over the course of a few days and that at some point during these days, if he failed to hear the brook flowing, which all the witnesses agree is a sound easily heard, he went close enough to the brook to see whether it was flowing or not.

Gallagher saw the brook in two types of situations while working as a security guard, the first during his regular rounds of the McLean campus and the second while looking for missing patients. For some of the observations he made during his regular rounds, he concluded that the brook was not flowing because he did not hear it. Given the testimony of the other witnesses on the subject and the steepness of the incline over which the brook flows at the top, he is no doubt correct that ordinarily if the brook is flowing it can be heard. I am unwilling, however, to accept that the absence of sound emanating from the brook is definitive proof that it was not flowing because it is conceivable that at very low flow the brook could be inaudible.

I find his testimony more persuasive concerning his observations during patient searches.

It could be objected that the focus of Gallagher's attentions at these times would most likely have been on the patient and not on flow conditions in the brook. But Gallagher's descriptions of what he saw when he entered the pool (a potential hiding place for a missing patient) are detailed and clear. I therefore credit his testimony that on a number of occasions he saw no water flowing out of the pipes that feed the brook.

Having found that Junction Brook flows throughout the year during some years but not others, I conclude that because of the way in which the Regulations define perennial stream, Junction Brook is not perennial. The Regulations expect perennial streams to flow throughout the year except in times of extended drought. See 310 CMR 10.58(2)(a)1.c. There is no evidence that there was an extended drought affecting flow in the summers of 1998, 1999, or 2000. Hence, because I have found that the brook ceased flow sometime during those summers, I must also find that it is intermittent.

II. Intermittent Stream Analysis

I do not find it to be an intermittent stream, however. A stream that flows intermittently is considered a stream for purposes of the Wetlands Protection Regulations "except for that portion upgradient of all bogs, swamps, wet meadows and marshes." See 310 CMR 10.04. Petitioners alleged initially on appeal that Junction Brook has bordering vegetated wetlands associated with it, which if true would mean that at least the brook meets the regulatory definition of intermittent stream. But petitioners dropped that claim prior to hearing, and consequently that issue was not tried.

Some of the testimony introduced at the hearing might have had a bearing on that issue. D'Amore asserted that the source of water for the spring that used to feed Junction Brook was a

red maple swamp at the northeastern end of the property. This claim was questioned by McLean because surface water from the swamp drains west, rather than south toward the brook. But D'Amore testified that the bedrock in this area has fissures that run north/south, and hence groundwater in the swamp could travel through the fissures to reach the spring. Although DiPietro suggested another possible location for the source of the spring's water, I am inclined to think that D'Amore, who has far more expertise in geology, is more likely correct.

This matters to the present analysis because, if the brook is still being fed by groundwater from the red maple swamp, then it meets the intermittent stream definition. But as I noted in my earlier discussion of the spring, the record is not clear on what happened to groundwater that fed the spring. D'Amore performed no tests to determine if groundwater from the swamp was still feeding the brook. In the absence of some proof that the swamp is a present source of the brook's water, I cannot find that Junction Brook is an intermittent stream.

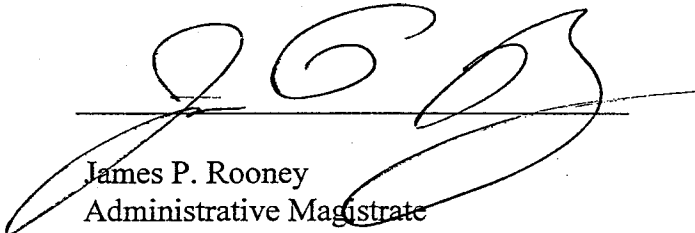
Conclusion

After a hearing, I conclude that Junction Brook, on the McLean Hospital campus, is not a river because in at least some years it flows intermittently. I also conclude that Junction Brook is not an intermittent stream as defined in the Wetlands Protection Regulations because the evidence does not establish that it flows out of or through a bog, swamp, wet meadow, or marsh. I therefore affirm the superseding determination of applicability issued by DEP.

Notice

This decision is a recommended final decision of the administrative magistrate. It has been transmitted to the Commissioner for his final decision in this matter. The decision is therefore not a final decision subject to reconsideration under 310 CMR 1.01(14)(d), and may not

be appealed to Superior Court pursuant to M.G.L. c. 30A. The Commissioner's final decision is subject to rights of reconsideration and court appeal and will contain a notice to that effect. Because this matter has now been transmitted to the Commissioner, no party may file a motion to renew or reargue this recommended final decision or any portion of it, and no party shall communicate with the Commissioner's office regarding the decision unless the Commissioner, in his sole discretion, directs otherwise.



James P. Rooney
Administrative Magistrate

SERVICE LIST

In Re: Martha Jean Eakin, et al.
Docket No. 2002-013

File No. SDA

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CONCOM

Belmont Conservation Commission

DEPARTMENT

Dept. of Environmental Protection

DEPARTMENT

Dept. of Environmental Protection

PARTICIPANT