

April 27, 2015

Steve Shrader, P.E.
Project Management and Engineering
Public Works Department, Municipality of Anchorage
4700 Elmore Road
Anchorage, AK 99519

Re: **KLATT BOG REHYDRATION
FLOODING THREAT AND LIABILITY**

Dear Mr. Shrader,

You and your staff were notified early last summer of a public safety threat on the north edge of Klatt Bog. This is written to document the situation and place the Municipality of Anchorage on notice that bog water levels are rising and the dike intended to protect the neighborhood is failing.

My wife Kim and I reside at 2100 Patriot Circle, part of Concord Hills Subdivision on the north side of the bog. Kim has lived in this house since it was constructed in 1994. I am a licensed civil engineer (Alaska CE 10859) with bachelors and masters degrees in civil engineering and 32 years of professional private practice experience in the water resource management arena.

Problem Description

Water levels in the bog behind our home have risen significantly in recent years. Where we used to walk in tennis shoes, we now must use waders. In 2005, a rapid snowmelt runoff event overtopped the dike between our house and that of our neighbor to the west. In the spring of 2013, seepage through the dike surfaced in our back yard. We've had standing water every ice-free month since 2013. It rises and falls with pond level on the other side of the dike. Grass, trees, and raspberry plants are dead. Our garden plot is unusable. During this same two-year time frame, seepage and/or low overtopping have been occurring in a half dozen back yards along this segment of the dike.

Today as I am writing this, following the driest winter in recent memory [accumulated snowfall since September 2014 is at 31% of normal], I see standing water in our back yard. On the bog side of the dike, a few inches below its crest, the water surface is level with the finish floor elevation of our home. Most of the homes in the neighborhood are lower than ours.

The dike crest is too low for the water levels we're seeing. It is also too thin in places and, it would appear, poorly constructed of local peat. I have searched historical records provided by MOA, State of Alaska, and USACE in vain for dike construction documents. Walking the bog perimeter I find no surficial evidence of geofabric, impervious liner, cutoff walls, imported fill, filters, or other features one might expect in embankment intended to hold water. In response to my request for design and construction documents for the Municipality's 2005 dike construction I am informed there are none. What I have learned is that the MOA contractor used unsuitable excavated material left over from a storm sewer project near Constitution Avenue to raise and widen 530 linear feet of the dike without plans, materials specifications, compaction standards, or other quality controls.

Certainly you are aware such work is well outside the norms for acceptable design and construction practice—particularly egregious considering the dike is intended to protect homes from flooding.

One thing to understand about earthen impoundments—overtopping and down cutting are not the only failure modes. Seepage accounts for 40 to 50 percent of all earthfill dam failures.

Seepage forces are always at work. It may take time, but seeping water will eventually find and exploit embankment defects. Water saturates soil, reduces inter-particle adhesion, and builds hydrostatic pressure. Seepage failures typically begin as a seep on the downstream face and/or ponded water at the toe--precisely what I'm seeing in my backyard. This can progress until full failure occurs, often suddenly.

For nineteen straight years my back yard has been dry. For the past two it has been wet. This is significant.

Water levels in Klatt Bog are rising and the dike protecting my neighborhood is failing. Unless effective action is taken, this condition can be expected to worsen. At some point the dike will be breached and the neighborhood flooded.

Reporting Difficulty

Efforts to bring this concern to the attention of public officials have been unnecessarily difficult. In the summer/fall/winter of 2013 I made eight separate inquiries (four calls to MOA, three calls to ADOT-PF, one phone call and one onsite meeting with USACE) in order to ascertain who had ownership and jurisdiction over Klatt Bog. MOA officials claimed the bog was owned by the State. ADOT-PF staff told me the Municipality owned the property. It was apparent nobody wanted to deal with this issue.

Not until spring 2014 was I able to learn the property had been conveyed from the State to the Municipality in 2001.

Responsibility

My exertions to effectively communicate with MOA officials regarding the Klatt Bog threat continue to be frustrated. The response pattern is to evade or deflect responsibility. In September 2014, long after the ownership issue had been put to rest and just as details of the 2001 conveyance arrangement were emerging, MOA Private Development Manager Kent Kohlhase sent me an email claiming:

- The State owns the bog parcel;
- Recent impacts along Patriot Circle are “perhaps due to increased rain and snow”;
- It is not apparent that MOA actions caused “this changed hydrology”; and
- Since the dike is on homeowner association property, Concord Hills HOA is responsible for fixing the problem.

First, the State does *not* own the bog parcel--the Municipality does. Second, wetlands and dikes should be able to handle rain and snow. Third, a *bucketload* of MOA actions have *profoundly* changed Klatt Bog hydrology. As for HOA responsibility for its dike, I agree. Every land owning entity has the obligation to responsibly manage its property-including the Municipality of Anchorage. Regarding its property ownership responsibility, consider that MOA:

- Acquired the subject parcel in 2001 [and now owns essentially the entire bog] with legal obligation to manage it in accordance with a yet-to-be-prepared Rehydration Plan so as to avoid water-related damage to nearby properties [See attached *Conveyance Subject to Conservation Easement* agreement between ADOT-PF and MOA, dated October 29, 2001];

- Has possession of State-commissioned studies by Dames & Moore (1999), a Technical Advisory Committee of hydrologic and hydrogeological experts (2003), and CH2M Hill (2005/2006) addressing the liability issue and recommending a significant level of additional study before proceeding with rehydration in order to protect properties outside the bog;
- Establishes and enforces policy for the development of public and private properties within, adjacent to, upstream, and downstream of the bog;
- Has approved subdivision plans and issued building permits for hundreds of homes located along the dikes and immediately downslope from the bog property.
- Continues to develop Municipal property within and around the bog;
- Continues to approve residential and commercial development of private property [replacing natural ground with several million square feet of impervious surface] in the Klatt Bog watershed;
- Approves, owns, and operates diversions, detention basins, culverts, and outfalls emptying storm water into the bog; and
- Owns and has maintenance responsibility for water conveyance systems traversing and exiting Klatt Bog.

Very few entities have such control over their property. Very few have in-house engineers, a hydrologist, wetlands specialists, data analysts, and technicians, coupled with site-specific studies and data assembled by various public agencies and their consultants over several decades. Anchorage has more than adequate resource to manage this property responsibly.

Wetland Management

Responsible management, including development-related decisionmaking, for such a large urban wetland requires a fundamental understanding of its hydrology. This shouldn't be downplayed—there is a lot at stake.

Unfortunately, no one has conducted a comprehensive water budget for Klatt Bog since 1986 (Glass, USGS) when it was twice its present size with a tiny fraction of today's peripheral development. A lot has changed since then. Yet I'm not aware of anyone measuring pond levels or surface flow into or out of the bog. Aerial photographs are no substitute for an organized monitoring program producing useable data. Having walked the property and its water courses, I haven't found so much as a staff gage, weir, or other means of measurement. Although dozens of monitoring wells were installed for the 2005 CH2M Hill study, none are being monitored today. When I asked for well data not already contained in the CH2M Hill report, I received a smattering of unprocessed field notes collected by a USACE employee before she retired several years ago.

Without valid data for calibrating analytical models, no one can reliably forecast wetland performance under various development scenarios. Decision makers don't even have enough information to quantify recent runoff history, ascertain short or long term trends, or monitor existing water levels. MOA seems to be managing its wetland property in the dark.

This would explain why your staff was surprised last summer to see water flowing through and over the dike in my neighborhood. Its also why many at MOA have been operating under the perception Klatt Bog is drying up while those of us living near and frequenting the wetland hold the opposite view. In recent years, without hard data or rehydration plan, MOA has been making development decisions based on the perception Klatt Bog must be rehydrated. My back yard says this isn't true.

The Municipality of Anchorage must stop rehydrating Klatt Bog without a Rehydration Plan.

I am not suggesting Klatt Bog is approaching its pre-development saturation levels. That isn't feasible, or possible, given the degree of urbanization on every side. Nevertheless, it is wetter now than two decades ago when our home was built.

Weather, Watershed

Its time to stop blaming this problem on the weather. Yes, weather and runoff have a relationship. However, weather is variable. That's why we study climate and hydrology, then design for the extreme condition to protect life and property. Rehydration plans and dikes are no exception.

In reality, Anchorage hasn't been experiencing much in the way of extreme weather lately. The 2005 dike overtopping resulted from a not-uncommon, midwinter melting event. Had that occurred during the 2011/2012 record-breaking winter for snow accumulation, it could have been much worse. In 2013 and 2014 we had above normal precipitation spread over a long time frame. Conversely, precipitation these past eight months was well *below* average. Presently, water is lapping at the dike behind my home and seeping into the back yard. I expect it will recede as the present dry conditions continue. Nevertheless, despite normal variability in the weather, the Patriot Circle water problem is hanging in there.

Although precipitation is a component of the hydrologic cycle we have no control over, the watershed is a component over which we can exert considerable control. In urban watersheds such as Klatt Bog's, runoff patterns are often heavily impacted by development and human land use. Anchorage development over the decades has:

- Reduced Klatt Bog in size from 3,480 to 300 acres;
- Ringed it with roads and subdivisions;
- Pushed up dikes on its northern, western, and southern borders;
- Placed offices, warehouses, small retailers, and big box stores with acres of impervious rooftop and parking lot within the watershed; and
- Routed storm runoff into the east end of the Bog.

The above facility improvements were approved, and in some cases built, by the Municipality of Anchorage. Without passing judgment on the value or advisability of such development, accountability demands that each of us accept responsibility for our part. MOA has played a central role in development decisions with enormous cumulative impact on the hydrology of this wetland.

Observed site conditions, including ponding and runoff patterns, cause me to believe that a professionally conducted hydrologic analysis will find that the higher water levels we are seeing in Klatt Bog are largely attributable to two factors: increased storm water inflow from upstream development and reduced hydraulic capacity [from lack of maintenance] in the cross-bog ditches that feed the outlet. Put simply, more is entering while less is exiting via the ditch system. Water consequently backs up, puts pressure on the dikes, and finds other routes out of the bog. This is a working hypothesis. A more thorough evaluation would be necessary to quantify the respective impacts of these and other factors.

Regardless of what may be going on hydrologically in the watershed, the fact remains that the Municipality of Anchorage acquired an urban wetland with knowledge of the liability and under the stipulation it would be managed to protect adjoining property owners. One of those property owners brought a legitimate public safety concern to your attention last summer. Instead of straight talk and effective action, the municipal response has been evasion, misstatements, and denial.

Department Letter

On September 29, 2014 the attached letter, which you acknowledge was approved by you and others in your department, was sent to inform me of the Municipality's position. I take factual exception to much of the content. See below.

Pg 1, Paragraph 3. Although it cites the State's obligation to prepare and implement a Rehydration Plan, no mention is made of MOA's obligation to manage the property according to said plan. The word "implement" in the second to last sentence should be replaced with "prepare."

Pg 1, Paragraph 4. First sentence, replace the word "understood" to "agreed." Second sentence is false. Nowhere does the Conveyance Agreement allow the State to duck its obligation to put together a legitimate Reclamation Plan. Nor does it say that if the State were to default, "the Municipality would simply begin managing the property to protect the wetlands in their existing state." This fabrication runs against the grain of the entire document.

Pg 2, Paragraph 2. First sentence is a statement of municipal opinion, which in and of itself is problematic. Apparently the letter's authors believe they are doing a fine job. Let's leave it at that and not attempt to represent what "the Municipality believes." The second sentence is false. The qualifiers "on the property" appear to have been inserted in an attempt to narrow the scope. However, the sentence is still false. Municipally-owned South Anchorage Sports Park is one example. Culverts, outfalls, roads, parking areas, and even graded ball fields alter the runoff hydrograph. In addition to the improvements already constructed, the SASP is slated to eventually be expanded to 65 acres.

Pg 2, Paragraph 3. This describes the Municipality's 2005 dike project mentioned earlier. This project raised and widened 530 [not 150 to 200] linear feet of dike. Also, it did not terminate at "a higher point in the dike." Instead, its terminus ramps downward into the thin dike just past my southwest property corner. Particularly damning, the Municipality's contractor used "unusable excavation material" to build up the dike. Material unsuitable for common trench backfill was inexplicably deemed acceptable for constructing 530 linear feet of dike intended to protect life and property. Recall this is the project without plans, specifications, compaction, or other quality controls. The last sentence in the paragraph acknowledges that MOA benefited from having a close, cheap location to dump its waste material. However, the presumption of mutual benefit for the flooded property owner is mistaken. Kim and I own the lot that flooded in 2005 and we aren't happy with MOA's fix. Without informing or consulting us, the Municipality filled the dike at the property corner, shifting the crest low point from the corner to the center of our back lot line. Now if the dike is overtopped, it will empty into the back center of our lot and flood water won't have a clear route along the house side swale to the catch basin in front.

Pg 2, Paragraph 4. Third sentence is false. The first part of the sentence references a 1980's era USGS report to conclude that the "bog ditches continue to draw down groundwater." That report is 30 years old. Using it to describe today's situation is nonsensical. The ditches are even older and, without maintenance, are choked with sediment, debris, sod, undergrowth, and trees. I've walked them and assure you they are no longer doing the job. Regarding "strict" USACE conditions restricting diversions into the wetlands--this doesn't sound like the Corps I know--the claim could use some documentation. As for having "no evidence to suggest that the bog is not continuing to slowly dry out," such double negative

language allows the presumed assumption to thrive in an evidence-free environment. Perhaps this is why MOA isn't showing a lot of interest in collecting hard evidence. It isn't measuring flow into or out of the bog, monitoring its wells, or seriously considering the evidence in my neighborhood. Actual evidence is likely to alter that assumption.

Pg 2, Paragraph 5. First and second sentences are false. There is no Rehydration Plan and USACE stopped monitoring the wells years ago. Even when they were out there, the few unprocessed measurements collected from a smattering of wells on a wetland of this size are next to useless. It appears there has been no significant monitoring effort since the CH2MHill work ten years ago. Sans post-2005 monitoring data, the paragraph's third, fourth, fifth, sixth, and seventh sentences have no basis or validity.

Pg 3, Conclusion. Second bullet point insisting that Concord Hills is responsible for maintaining its dike is more than a little hypocritical, considering that MOA mucked up this very dike in 2005. Fourth bullet point, "the activities of the Municipality has not impacted (positively or negatively) Klatt Bog" is the capper. Aside from the grammar, and without getting pulled into a subjective discussion about positive versus negative impacts, this is a stunningly brazen and preposterous claim. MOA presided over the transformation of 3,480 acres of natural free flowing wetland into a 300-acre, fully circumscribed detention basin for urban runoff. And here I'm being told the Municipality has had no impact. Unbelievable.

I seem to have entered a world where public officials feel free to deny and deflect, make decisions without consequence, and stake the most outrageous claims with impunity. Moreover, these same individuals are in positions of considerable responsibility, making ongoing development-related decisions throughout our community. They are the ones commissioning studies, meeting with developers, approving projects, issuing permits, and informing the public.

Conclusion, Expectations

In summary, the State and MOA walked away from their legal agreement to develop and implement a Rehydration Plan specifically intended to protect adjacent property. The Municipality has since been approving private and community development with the perception Klatt Bog is drying out and must be rehydrated. There has been no attempt at meaningful monitoring and assessment of impact. When presented with unambiguous evidence that adjacent properties are not being protected, the municipal response has been blanket denial of culpability, factual misconstruction, self-serving fabrications, and assignment of blame.

Concord Hills HOA inherited a poorly designed and constructed dike from the developer. The problem was compounded in 2005 when MOA reconstructed 530 linear feet with substandard materials and workmanship. Now municipally-owned and managed Klatt Bog is ponding water against the dike. Those of us on the downstream side are directly impacted and threatened. MOA has significant responsibility and liability here.

According to my engineering understanding of dikes in general and State of Alaska Dam Safety regulations in particular, a dike is distinguished from a dam in that it is a normally dry flood control structure. Dikes are not intended to hold water for sustained periods. Consequently, the ponding issue raises questions of definition with potentially consequential regulatory and liability implications. If, for example, the Municipality continues to rehydrate Klatt Bog and thereby maintain high water levels, perhaps these dikes should be reclassified as dams.

April 27, 2015

This is a public safety issue and these concerns are real. Actions have consequences, as does inaction. Municipal officers and staff are expected to act accordingly with due diligence, professionalism, competence, accountability, and respect. I have not asked for money or for MOA to repair the dike. Therefore, suggestions that I look elsewhere for money are not appreciated. Specifically, my expectation for the Municipality of Anchorage is to:

- Honor the obligations it made in 2001 when it acquired the bog parcel;
- Manage Klatt Bog, including its watershed, responsibly with competent awareness and take ownership for the impacts of its development-related decisions;
- Repair and maintain water control systems to control ponding along the dike perimeter;
- Work with Concord Hills and other HOA's, USACE, DNR-Dam Safety and other potentially affected parties to responsibly address the threat of dike failure and flooding; and
- Require the highest standards of integrity and professional conduct from MOA officials and staff, particularly when communicating about issues of public safety.

Toward these ends, in November I asked Mr. Kohlhasse to inform us as to the high water elevation we can expect in the rehydrated future. It seems unreasonable to expect HOAs to evaluate, raise, or upgrade their dikes without such information. I asked you in December for an opinion from MOA's Legal Department regarding the Municipality's obligations under the Conveyance Agreement and associated municipal ordinances. There has been no response to either request.

As stated at the outset, my purpose is to document the situation and put the Municipality on notice. I'm not looking for a reply nor do I want to debate. However, if you find I've missed something or misrepresented the facts, please let me know with specificity and supporting evidence. If I've made a mistake, expect a prompt correction and apology. If not, expect me to defend my position.

This is an 'ounce of prevention, pound of cure' opportunity and we will either pay now or we will pay later. No one within the reach of this letter can say they were not made aware. If you have any questions, please contact me. My public records request is to be kept informed and copied on all developments, decisions, and communications regarding this issue. Thank you.

Sincerely,
Glenn Foust, P.E.



Attachments: *Conveyance Subject to Conservation Easement (2001)*
September 29, 2014 Municipality of Anchorage letter to Glenn Foust

cc: Charles Cobb, Alaska Dam Safety Engineer, Alaska DNR
Steven Ellis, Flood Hazard Administrator, Watershed Management Section, MOA
Cliff Goughner, Bonanza Realty
Nicole Jones-Vogel, Community Development, Long Range Planning, MOA
Kent Kohlhasse, Private Development Manager, MOA
Greg Magee, Boardmember, Concord Hills HOA
Shane McCoy, Regulatory Division, USACE
David Schade, Water Resources Section Chief, Alaska DNR
Jeffrey Urbanus, Public Works Watershed Management Services, MOA
Dennis Wheeler, Municipal Attorney, Legal Department, MOA