GREAT SALT LAKE, ENVIRONMENTAL CRISES, AND SECURITIES LIABILITY

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SUMMARY

This Article examines the intersection of environmental crises and financial disclosure obligations through the lens of Great Salt Lake. As the lake shrinks to unprecedented levels, the resulting dust storms, diminished snowpack, and destabilized ecosystems increasingly threaten both the public health and economic viability of Utah's most populous region, and economic impacts will extend far beyond industries directly dependent on the lake. These environmental threats can translate into material financial risks for publicly traded companies and municipal bond issuers, potentially necessitating disclosure under existing securities law. While industries directly reliant on the lake's ecosystem may already face disclosure obligations, these will expand to include more sectors and geographic areas if the lake is allowed to continue to shrink. The Article argues that recognizing these growing securities liabilities presents a powerful additional reason for urgent policy interventions to restore the lake and safeguard the region's long-term economic viability. This case study shows how localized environmental crises generate systemic vulnerabilities across economic sectors, with implications for similar situations worldwide.

Unless Utah makes major changes to the status quo, Great Salt Lake is heading toward an ecological tipping point. If reached, the lake, particularly the dried lakebed, threatens to unleash an "environmental nuclear bomb."[1] Its fallout will include not only an ecological disaster for one of the West's keystone ecosystems, but also severe air pollution that threatens the livability of the Wasatch Front—Utah's most populous region and home to more than 2.6 million people.[2] Most alarmingly, it is increasingly clear that the policy tools currently available are insufficient to meet the challenge. While hope remains that the region will find the willingness to take the necessary steps, without dramatic changes, failure seems just a matter of time.

This Article examines a facet of what many Utahns might consider the unthinkable: a future where a dried Great Salt Lake begins to transform into a Great Salt Dust Bowl. The environmental threats of a drying lake have understandably captured worldwide attention, as the lake has lost approximately half its historic volume in just several decades.[3] However, a drying lake threatens more than just the region's environment. It also puts into peril the region's economic future.

In fact, long before the lake's ecosystem collapses or the region becomes unlivable, businesses will react as the Wasatch Front becomes an undesirable location for businesses and additional investment. If the lake moves closer and closer to the brink, its degradation will generate expanding circles of material risk to Utah's businesses.

Authors' Note: The authors thank the excellent editors at ELR *and also Prof. Michael Gerrard, who posed a question that ultimately inspired this Article.*

1. Christopher Flavelle, *As Great Salt Lake Dries Up, Utah Faces an "Environmental Nuclear Bomb,"* N.Y. Times, June 7, 2022, at A1.
2. World Population Review, *Utah Population 2024*, https://worldpopulationreview.com/states/utah-population (last visited Feb. 21, 2025); Benjamin W. Abbott et al., Emergency Measures Needed to Rescue Great Salt Lake From Ongoing Collapse (2023), https://www.researchgate.net/publication/366876763.
3. Melissa Cobo et al., *A Desiccating Saline Lake Bed Is a Significant Source of Anthropogenic Greenhouse Gas Emissions*, 7 One Earth 1414, 1420 (2024), https://doi.org/10.1016/j.oneear.2024.07.001 ("Human consumptive water uses, including agriculture, urban uses, and solar ponds, have led to a significant recent decline in lake levels, resulting in a roughly 50% reduction in lake surface area by the time of this study (2020).").

While the economic future of the region is a hefty concern for many reasons, here we focus on a narrow but currently overlooked point: namely, if the lake's direction remains unchanged, meaningful risks to businesses will continue to grow, which in turn will trigger securities disclosure requirements for publicly traded companies in the region or otherwise connected to the lake.

This relationship represents a critical inverse dynamic—as the lake declines, an increasing number and variety of businesses will face material risks, elevating the probability and scope of disclosure obligations. For certain businesses closely tied to the lake's ecosystem—from mineral extraction to brine shrimp harvesting to snow-dependent recreation—some types of disclosure obligations likely already exist. For the vast majority of other businesses, these requirements remain on the horizon but will steadily approach as the lake recedes further.

It is important to note that recognizing these escalating risks is not an assertion that regional business as usual is doomed; rather, it's a recognition of the interconnectedness between the lake's health and economic stability, and yet another reason for the region to prioritize lake restoration efforts. While market dynamics in Utah are not significantly affected at the moment, a continued decline in the lake's levels would lead to more widespread impacts, which underscores the urgency for comprehensive solutions.

The story of Great Salt Lake is significant, as are the securities disclosure implications of the challenge. Yet, what is happening to the lake fits into a much larger narrative of modern environmental crises. Particularly in light of climate change, along with the growing pressures stemming from a growing and modernizing human population, local environmental disasters have sadly become increasingly common. In many ways, the risks facing the lake provide a microcosm of localized environmental disasters. So the impacts of securities law on the region are noteworthy not just because of their impacts along Utah's Wasatch Front, but also because they provide a case study of how securities law might impact other places facing increased vulnerability to localized environmental disasters.

We believe that Great Salt Lake's trajectory proves to be a paradigmatic case study in how ecological collapse generates far-reaching financial liabilities across economic sectors, with profound implications for securities disclosure liability. Indeed, the lake's deterioration reveals how local environmental decline can proliferate into systemic vulnerability, and it exposes latent weaknesses in regulatory structures. So, we posit, this crisis represents not just a localized emergency, but a harbinger of global patterns—from drought-stricken river basins to flooding coastal regions—that demand economic and legal mechanisms capable of addressing the financial consequences of ecological collapse.

The urgency of this inquiry highlights important, yet frequently neglected, stakes for legal innovation. The Great Salt Lake case study exemplifies what is all too common as our climate changes—environmental pressures outpace regulatory tools that are fundamentally ill-equipped to address both current and evolving ecological threats. This uneasy fit between the legal tools available and those needed to address the lake's decline provides an opening for the risk of failure, as well as a pathway to trigger assessment and disclosure of material risks under securities law.

This Article proceeds as follows: Part I maps the lake's decline, including causes and broader implications; Part II explores analogous crises accelerated by overconsumption and climate change; Part III offers a detailed examination of securities disclosure law and its capacity to address environmental catastrophes, including how various economic actors may face disclosure obligations related to ecological emergencies such as a receding Great Salt Lake; and Part IV concludes by considering the broader implications of this analysis for the future of environmental risk disclosure in an era of accelerating systemic risk.

As we confront the environmental challenges of the 21st century, Great Salt Lake's story offers crucial lessons about the interconnectedness of ecological and economic systems. By tracing how its decline manifests as material risk across markets, we can begin to chart a course toward more robust and responsive frameworks for environmental risk disclosures that loom on the horizon.

I. The Economic Stakes of a Drying Great Salt Lake

A. *Great Salt Lake Crisis*

Great Salt Lake, the largest saline lake in the Western Hemisphere,[4] faces an unprecedented ecological crisis.[5] Once larger than Rhode Island and Delaware combined,[6] the lake shriveled to its lowest recorded level in 2022.[7] The lake's retreat laid bare more than 50% of its lakebed, exposing over 800 square miles of dried lakebed, an area surpassing the size of Maui.[8]

Great Salt Lake's decline grows out of several causes, with unsustainable water consumption the principal driver of the decline, compounded by climate variability and rising global temperatures.[9] The lake's water sources—tributary rivers and streams—have been systematically siphoned

4. Brian Steed, Great Salt Lake: The Great Salt Lake Strategic Plan 4 (2024).
5. Wayne A. Wurtsbaugh et al., *Decline of the World's Saline Lakes*, 10 Nature Geosci. 816 (2017), https://www.nature.com/articles/ngeo3052 (explaining that, specifically relating to Great Salt Lake, "[a]lthough droughts and wet periods cause river inputs and lake levels to fluctuate, the level has persistently declined since pioneers arrived," largely due to human consumption because "there has been no significant long-term change in precipitation or streamflow from mountain tributaries that could have driven this change since pioneers arrived in 1847").
6. W.R. Hassibe & W.G. Keck, U.S. Department of the Interior, The Great Salt Lake 2 (1991), https://pubs.usgs.gov/gip/70039229/report.pdf.
7. Steed, *supra* note 4, at 3.
8. Carter Williams, *Toxic Dust Hot Spots*, Univ. Utah Coll. Sci., https://science.utah.edu/news/toxic-dust-hot-spots/ (last visited Feb. 21, 2025).
9. Steed, *supra* note 4, at 5-11; *see also* Great Salt Lake Strike Team, Great Salt Lake Policy Assessment 4 (2023) (explaining that the record-low elevation is attributable to three factors: (1) direct evaporation from climate warming has an estimated impact of 8%-11%; (2) natural variability of precipitation and runoff efficiency has an estimated impact of 15%-23%;

away for agricultural diversions, municipal consumption, and industrial use, accelerating the lake's transformation from a stable ecological system to one approaching a critical threshold of collapse. This unfolding crisis carries profound implications for public health, ecological stability, and economic resilience, threatening the long-term habitability of the region.

Great Salt Lake's decline threatens the health of those living in the region.[10] As the lake retreats from its historic shoreline, it exposes vast stretches of desiccated lakebed laden with heavy metals and other toxins. When winds sweep across the exposed bed, they whip up the fine dust into dust storms that threaten not only communities near the lake, but also populations hundreds of miles away. Experts have warned that this toxic dust poses "an immediate health risk to *all* residents" living along Utah's Wasatch Front.[11]

Even without considering its toxic composition, the mere inhalation of dust particles (particulate matter) presents severe public health implications. Great Salt Lake dust is composed of a hazardous blend of airborne particles: 80% particulate matter with a diameter of 10 microns or fewer (PM_{10}) and 20% fine particulate matter ($PM_{2.5}$)[12]—microscopic particulates so fine they infiltrate the human respiratory system. These particles present a spectrum of health threats: PM_{10} exposure triggers impacts from respiratory distress and asthma to cardiovascular complications and even premature death,[13] while the even smaller $PM_{2.5}$ particles permeate even further, compounding these baseline risks with additional threats, including impaired childhood development and type 2 diabetes.[14]

Adding complexity to these already severe health threats, scientific analysis has uncovered a more pernicious danger: Great Salt Lake's waters hold in place accumulated heavy metals and other toxins[15] that settled into its sediments—sediments where testing reveals arsenic and other contaminants at concentrations exceeding U.S. Environmental Protection Agency (EPA) residential and industrial screening thresholds.[16] As the lake recedes, it transforms once-sequestered contaminants into airborne hazards, with dust storms carrying not only harmful particulates, but also a dangerous mix of toxins, posing a threat to human health across the region.

As the lakebed expands, so too will the frequency and intensity of these dust storms, exacerbating already poor air quality in the region.[17] Without urgent, systemic intervention, Great Salt Lake risks replicating the environmental collapse of Owens Lake, where Los Angeles' early 20th-century water diversions initiated an environmental crisis that persists today. Despite its modest size—just one-fifteenth the size of Great Salt Lake[18]—Owens Lake's exposed bed is the nation's largest source of PM_{10} pollution, even after decades of costly mitigation efforts.[19] This

and (3) natural and human consumptive use has an estimated impact of 67%-73%).

10. *See* Abbott et al., *supra* note 2; Hamidreza Aghababaeian et al., *Global Health Impacts of Dust Storms: A Systematic Review*, 15 Env't Health Insights PMC8150667 (2021); Wayne Wurtsbaugh et al., *Impacts of Water Development on Great Salt Lake and the Wasatch Front* (White Paper 2016), https://www.researchgate.net/publication/295861948_Impacts_of_Water_Development_on_Great_Salt_Lake_and_the_Wasatch_Front.

11. Great Salt Lake Strike Team, *supra* note 9, at 29 (emphasis added) (stating that "dust episodes pose an immediate health risk to all residents along the Wasatch Front due to inhalation of particulate matter (i.e., [particulate matter with a diameter of 10 microns or fewer] PM_{10}) and high concentrations of arsenic"). The Wasatch Front is the area located between the Wasatch Mountain Range to the east and Great Salt Lake to the west, extending 105 miles from Brigham City to Provo. It is home to Utah's capital city and roughly 80% of the state's population. *See* Britannica, *Wasatch Front*, https://www.britannica.com/place/Wasatch-Front (last visited Feb. 21, 2025).

    While the Great Salt Lake Strike Team has emphasized the immediate health risks lakebed dust poses to residents along the Wasatch Front, research demonstrates that particulate matter can travel vast distances, with studies showing that dust events from North Africa substantially elevate fine particulate matter ($PM_{2.5}$) concentrations across southern Texas and impact extensive regions of the South, Southeast, and East Coast of the United States. *See, e.g.*, Ayse Bozlaker et al., *Identifying and Quantifying the Impacts of Advected North African Dust on the Concentration and Composition of Airborne Fine Particulate Matter in Houston and Galveston, Texas*, 124 J. Geophysical Rsch.: Atmospheres 12282 (2019).

12. Great Salt Lake Advisory Council, Assessment of Potential Costs of Declining Water Levels in Great Salt Lake 49-50 (2019), https://static1.squarespace.com/static/5a46b200bff2007bcca6fcf4/t/6001c7329a723265a8694d30/1610729269410/Potential+Costs+of+Declining+Water+Levels+in+GSL.pdf. PM_{10} are particles with an aerodynamic diameter <10 micrometers (μm) while $PM_{2.5}$ are particles with an aerodynamic diameter <2.5 μm. U.S. Environmental Protection Agency, *Particulate Matter (PM) Basics*, https://www.epa.gov/pm-pollution/particulate-matter-pm-basics (last updated June 20, 2024).

13. C. Arden Pope et al., *Daily Mortality and PM_{10} Pollution in Utah Valley*, 47 Archives Env't Health: Int'l J. 211 (1992).

14. *See* Jae Hyun Kim, *Ambient Air Pollution and Pediatric Diabetes*, 64 Clinical & Experimental Pediatrics 523 (2021); Natalie M. Johnson et al., *Air Pollution and Children's Health—A Review of Adverse Effects Associated With Prenatal Exposure From Fine to Ultrafine Particulate Matter*, 26 Env't Health & Preventive Med. 1 (2021), https://pmc.ncbi.nlm.nih.gov/articles/PMC8274666 (concluding that exposure to particulate matter adversely affects "children's respiratory systems, immune status, brain development, and cardiometabolic health" before they are even born).

15. Reuben Attah et al., *Assessing the Oxidative Potential of Dust From Great Salt Lake*, 336 Atmospheric Env't 120728 (2024) (finding that Great Salt Lake dust's oxidative potential "was associated with metals, including Cu [copper], Mn [manganese], Fe [iron], and Al [aluminum]"); *see also* Williams, *supra* note 8 ("The lakebed contains levels of arsenic, lanthanum, lithium, zirconium, copper and other metals above the Environmental Protection Agency's residential and industrial standards."); Abbott et al., *supra* note 2, at 9 (listing harmful pollutants found in Great Salt Lake sediment, including "arsenic, cadmium, mercury, nickel, chromium, lead, copper, selenium, organic contaminants, and cyanotoxins").

16. Atmospheric scientist Kevin Perry measured every square meter of exposed Great Salt Lake lakebed between 2022 and 2023. He found that every arsenic measurement was greater than the regional screening levels established by EPA for residential and industrial exposures. Kevin D. Perry et al., University of Utah, Results of the Great Salt Lake Dust Plume Study (2016-2018), at 55-57 (2019), https://d1bbnjcim4wtri.cloudfront.net/wp-content/uploads/2019/12/10101816/GSL_Dust_Plumes_Final_Report_Complete_Document.pdf; Kevin Perry, Spatial Variability of Surface/Subsurface Geochemistry of the Exposed Playa of the Great Salt Lake, Utah (2021), *available at* https://ui.adsabs.harvard.edu/abs/2021AGUFM.B41A..07P/abstract.

17. Great Salt Lake Strike Team, *supra* note 9, at 29 ("Dust plumes from the Great Salt Lake lakebed have increased in frequency and severity as the lake has receded.").

18. *Id.*

19. Sara E. Grineski et al., *Harmful Dust From Drying Lakes: Preserving Great Salt Lake (USA) Water Levels Decreases Ambient Dust and Racial Disparities in Population Exposure*, 7 One Earth 6 (2024) ("Dust mitigation costs have exceeded the economic value of the diverted Owens Lake water."); EPA Region 9, *Air Actions, California: Owens Valley Particulate Matter Plan Q&A*, https://19january2017snapshot.epa.gov/www3/region9/air/owens/qa.html

sobering precedent, when scaled to Great Salt Lake's vastly larger footprint and proximity to major population centers, would be nothing short of catastrophic.

Beyond human health implications, the lake's decline threatens crucial ecological systems. Great Salt Lake supports a globally significant ecosystem, hosting more than 10 million migratory birds annually along the Pacific Flyway, many of which depend on the lake's unique mix of wetlands, brine shrimp, and food webs.[20] The lake's brine shrimp population, which helps feed tens of millions of people globally through aquaculture operations, is threatened as salinity levels exceed biological tolerances.[21] More broadly, the destabilization of this keystone ecosystem would generate a hemispheric-scale ecological disruption.[22]

The effects of Great Salt Lake's decline would spell disaster not only for human and ecosystem health, but for the very fabric of life in Utah and beyond. The lake's health is inextricably linked to the region's economic viability, and as the lake's vital functions deteriorate, the implications for regional prosperity and development warrant careful examination, which we will explore in the next section.

B. *Economic Impacts of an Ailing Great Salt Lake*

The economic consequences of Great Salt Lake's decline are far-reaching and multifaceted, affecting regional systems in ways that extend beyond immediate environmental damage. From direct industrial losses to more subtle disruptions in community resilience and quality of life, the lake's retreat threatens economic stability and creates material risks for businesses, investors, and municipalities alike.

The economic damage inflicted by the lake's deterioration could cost Utah billions of dollars a year and eliminate thousands of jobs.[23] Yet these headline estimates fail to fully capture the breadth of economic pain at stake. Lessons from other terminal lakes, from the Aral Sea to Owens Lake, demonstrate how ecological collapse can trigger cascading economic effects that fundamentally reshape regional economies.[24] The key distinction is that, unlike these examples, the impacts from a potentially desiccated Great Salt Lake remain largely preventable with timely and effective intervention. There is a critical window for policy action to avert the most severe economic consequences.[25]

For illustrative purposes, this discussion highlights in generalities the kinds of economic factors implicated by Great Salt Lake's decline, which may eventually require disclosure under securities law if the lake continues to recede. While not exhaustive, these examples serve as a warning of the types of material risks facing Utah's economy as a result of an ailing Great Salt Lake.

1. Direct Lake-Dependent Impacts

The most immediate economic consequences manifest through industries intrinsically tied to lake health and ecological function. These businesses currently stand at the frontline of disclosure requirements, as their operations and financial performance face direct, material impacts from the lake's decline. The mineral extraction sector faces particularly acute vulnerabilities as declining water levels threaten operational viability. Below the critical threshold level of 4,193 feet, extraction operations confront substantial infrastructure adaptation costs while facing potential losses of $1.3 billion in economic output and 5,368 jobs.[26] The Utah Legislature has already taken significant steps toward curtailing mineral extraction from Great Salt Lake due to the amount of water it requires.[27]

The brine shrimp industry, a cornerstone of global aquaculture that provides 35%-45% of world supply, confronts existential challenges as rising salinity threatens population viability.[28] The cautionary trajectory of terminal lakes elsewhere, where Lake Urmia has already lost its brine shrimp population entirely, suggests potential regional losses of $67 million in economic output and 574 jobs.[29]

(last updated Feb. 14, 2017) ("Owens Lake emits about 300,000 tons of PM-10 per year: 30 tons of this is arsenic and 9 tons is cadmium."); *see also* Great Salt Lake Advisory Council, Consequences of Drying Lake Systems Around the World—Summary of the February 15, 2019 Report Prepared by AECOM for the Great Salt Lake Advisory Council 5-6 (2019), https://static1.squarespace.com/static/5a46b200bff2007bcca6fcf4/t/6001c526b0b56c393b4bc0c0/1610728745439/Drying+Lake+Systems+-+Summary.pdf.

20. Steed, *supra* note 4, at 5 ("Birds rely on the lake, a critical link in the Pacific Flyway between North and South America. Every year, 10 to 12 million birds from 338 species come to rest, eat, and breed during migrations of a thousand miles or more."); Abbott et al., *supra* note 2.
21. Steed, *supra* note 4, at 3 (also stating that the lake "produces 40-45% of the world's annual supply of brine shrimp eggs, which are critical to aquaculture production" such as shrimp).
22. *See* Abbott et al., *supra* note 2.
23. A report prepared by the state-led Great Salt Lake Advisory Council estimated the monetized costs of a declining lake between $1.69 billion and $2.17 billion annually, along with more than 6,500 job losses, and between $25.4 billion and $32.6 billion over a span of 20 years. Great Salt Lake Advisory Council, *supra* note 12, at 83 ("The monetized costs describe only a portion of the consequences of declining water levels at Great Salt Lake."). These figures, in the authors' assessment, are a significant underestimate of the full extent of the impending financial impact, as they are solely estimates of monetized costs relating to lake-dependent losses.
24. Great Salt Lake Advisory Council, *supra* note 19, at 5-6.
25. *See* Abbott et al., *supra* note 2 (explaining that immediate and dramatic increases in water flow to Great Salt Lake are critical, but, nonetheless, the worst impacts are preventable).
26. *Id.* at 43.
27. H.B. 513, 65th Gen. Sess. (Utah 2023).
28. Great Salt Lake Advisory Council, *supra* note 12, at 40; *see also* Janet Nguyen, *If the Great Salt Lake Dries Up, What Would That Mean for the U.S. Economy?*, Marketplace (Sept. 22, 2023), https://www.marketplace.org/2023/09/22/if-the-great-salt-lake-dries-up-what-would-that-mean-for-the-u-s-economy/.
29. Great Salt Lake Advisory Council, *supra* note 12, at 40-41. Brine shrimp populations have diminished or disappeared altogether at other collapsing saline lakes. For example, increased salinity concentrations have threatened the brine shrimp population at California's Mono Lake. Lake Urmia in Iran was a former source of artemia, but now produces nothing. Similar to Lake Urmia, a diminished brine shrimp population "could be expected with Great Salt Lake drying, but [with] worse consequences for the millions of birds and brine shrimp harvesting industry that the Great Salt Lake supports." Great Salt Lake Advisory Council, Consequences of Drying Lake Systems Around the World 21, 51-52 (2019), https://lf-public.deq.utah.gov/WebLink/DocView.aspx?id=392794&eqdocs=DWQ-2019-010002&cr=1; *see also* Emma Penrod, *The World Needs to Feed 10 Billion People. The Great Salt Lake Could Teach Us How.*, Great Salt Lake Collaborative (Dec. 5, 2023), https://greatsaltlakenews.org/latest-news/great-salt-lake-collaborative/the-world-needs-to-feed-10-billion-people-the-great-salt-lake-could-teach-us-how.

The recreational sector faces parallel disruptions as the lake declines. The lake's decline heralds a systemic erosion of recreational opportunities, threatening the diverse array of recreation occurring at the lake, from birding[30] and waterfowl hunting,[31] to boating and sailing, to hiking and swimming.[32] Specifically, a shriveled lake has been projected to cost between $15.1 and $26.5 million in annual recreational use value from boating activities alone, while total recreation losses could reach $81.1 million in output and eliminate 615 jobs.[33]

2. The Systemic Impact of Dust Exposure

The exposed lakebed introduces complex systemic effects that ripple through regional economic systems. As the lake continues to decline, these systemic impacts expand to industries previously insulated from direct consequences. For instance, property values across the Wasatch Front face mounting pressure from deteriorating air quality and environmental conditions, with research demonstrating decreased market value in areas with elevated air pollution.[34] The lake's decline drives measurable reductions in property values throughout the region, reflecting a direct relationship between environmental degradation and real estate market performance.[35] Comparative analysis with the Salton Sea, where dust exposure has driven up to $7 billion in property devaluation in a substantially less populated region, suggests potentially greater implications for the Great Salt Lake region[36]—particularly given its vastly larger surface area of 3,300 square miles at peak levels, compared to the Salton Sea's 343 square miles.[37]

The widespread devaluation in property values due to the lake's decline will inevitably destabilize real estate markets. Studies have found a general decrease in market value of real estate and desirability to live in highly air-polluted areas.[38] Since real estate and homes in highly air-polluted areas are unfavorable, the toxic and airborne dust emerging from the lakebed will lower real estate market values across the Wasatch Front.[39]

While it is difficult to quantify the property value loss associated with the shrinking Great Salt Lake, looking at the economic consequences of other struggling saline lakes is helpful. The shrinking Salton Sea has caused up to $7 billion in property value loss largely from dust storms. Moreover, the billions of dollars in property value loss occurred "in a rural area with a much lower population than Great Salt Lake."[40]

Health-related economic impacts present another quantifiable dimension, with annual costs from dust exposure estimated between $6.6 and $22.3 million, as calculated by a government contractor.[41] These figures likely represent a conservative estimate.[42] Comparable situations at other

30. In Utah, the birding tourism industry is aware of the adverse effects of a drying Great Salt Lake. In May 2023, Davis County sponsored the "State of the Great Salt Lake" workshop to address how the lake's low water levels "increas[e] salinity concentrations in Gilbert Bay (South Arm) to the point where the ecological viability of the food web is now in peril, thus endangering the millions of birds that depend on that food web for survival." Davis County, Great Salt Lake Bird Festival 18 (2023), https://www.daviscountyutah.gov/docs/librariesprovider35/default-document-library/gslbf-program-booket.pdf?sfvrsn=1d5de553_3/GSLBF-Program-Booket.pdf; *see also* Great Salt Lake Advisory Council, *supra* note 12, at 57-60.
31. The effects of Great Salt Lake's decline also extend to the hunting sector. For instance, in response to the deteriorating conditions, Ducks Unlimited launched its Great Salt Lake Initiative "to provide natural infrastructure solutions to the region," citing the threat posed to the lake's ecological health by "severe drought and human impact[, which] are threatening the health of th[e] landscape." *Great Salt Lake Initiative*, Ducks Unlimited (Oct. 21, 2022), https://www.ducks.org/newsroom/great-salt-lake-initiative; *see also* Amy Joi O'Donoghue, *How Duck Hunters, Wetlands, and Conservation Help the Great Salt Lake*, Deseret News (July 15, 2022, 6:01 PM), https://www.deseret.com/utah/2022/7/15/23204597/great-salt-lake-utah-wetlands-ducks-unlimited-wildlife-saline-lakes-conservation-politics/.
32. During Great Salt Lake's record low levels in 2022, boats had to be removed from their slips at the Great Salt Lake Marina. While some boats were able to return to the marina after the 2022-2023 record snowfall, boaters have been cautioned "that one good water year doesn't erase years and years of drought." Great Salt Lake Advisory Council, *supra* note 12, at 53-54, 61-63; Utah Division of Water Resources, *Great Salt Lake*, https://water.utah.gov/great-salt-lake/ (last visited Feb. 21, 2025); Brian Schnee, *Sailors Get Boats Back in Great Salt Lake After Winter Takes Bite Out of Hull-Drying Drought*, KUTV (June 13, 2023), https://kutv.com/news/instagram/more-water-boats-return-to-great-salt-lake-marina-drought-snowpack-summer-winter-snowfall-runoff-gsl-utah.
33. Great Salt Lake Advisory Council, *supra* note 12, at 63, 68.
34. *Id.* at 45-46. *See* Daniel M. Sullivan, Harvard Environmental Economics Program, Discussion Paper No. 16-69, The True Cost of Air Pollution: Evidence From House Prices and Migration (2016) (presenting evidence that the effects of air pollution on the housing market are significantly underestimated when using conventional measures, but using a new model to measure pollution exposure reveals that homes in areas with improved air quality increase in value by 1.8% on average). *See also* Kenneth Y. Chay & Michael Greenstone, *Does Air Quality Matter? Evidence From the Housing Market*, 113 J. Pol. Econ. 376 (2005) (analyzing the impact of the Clean Air Act regulations on housing market values and finding that improved air quality significantly increases property values).
35. Great Salt Lake Advisory Council, *supra* note 12, at 45-46.
36. Great Salt Lake is substantially larger than the Salton Sea and is situated near a considerably more populous area. Consequently, the potential property value depreciation resulting from the lake's decline could significantly surpass the losses documented in the Salton Sea region. Thus, the property value losses associated with the shrinking Great Salt Lake could consequently be much greater. Great Salt Lake Advisory Council, *supra* note 19, at 3, 6.
37. Utah Division of Water Resources, *supra* note 32 ("In 1986, the surface area was at the historic high of 3,300 square miles . . . ."); Salton Sea Authority, *F.A.Q.*, https://saltonsea.com/about/faq (last visited Feb. 21, 2025).
38. *See, e.g.*, Mark P. Berkman et al., *The Adverse Impact of Particulate Matter on Property Values*, 15 Int'l Real Est. Rev. 215 (2012) (finding "that a 10-percent increase in PM concentration results in a statistically-significant 1.1-percent decrease in value"); Yonghua Zou, *Air Pollution and Housing Prices Across Chinese Cities*, 145 J. Urb. Plan. & Dev. 04019012 (2019) (revealing an inverse relationship between the value of real estate and the magnitude of air pollution across Chinese cities); Sullivan, *supra* note 34.
39. Great Salt Lake Advisory Council, *supra* note 12, at 45-46 (noting that "declining lake levels are positively correlated to property values—as lake levels decline, property values near the lake also decline").
40. Great Salt Lake Advisory Council, *supra* note 19, at 3, 6.
41. Great Salt Lake Advisory Council, *supra* note 12, at 53.
42. Michael J. Cohen, Pacific Institute, Hazard's Toll: The Costs of Inaction at the Salton Sea 12-19 (2014) ("Many scientific and medical studies document the link between blowing dust and a broad range of public health impacts, including childhood and adult asthma, cardiac disease, lung cancer, and increased mortality rates." A study that estimated the magnitude of these costs based on a cost per unit of exposed dust found that "under a worst case scenario, with high projected dust emissions and very limited air quality management, the present value cost of uncontrolled dust emissions on public health could be $37 billion through 2047."); Gilda Zarate-Gonzalez et al., *Costs of Air Pollution in California's San Joaquin Valley: A Societal Perspective of the Burden of Asthma on Emergency Departments and Inpatient Care*, 17 J. Asthma & Allergy 369 (2024). A 2016 study of the San Joaquin Valley estimated that air pollution-related losses are wide-ranging and reflect societal value losses over various sectors, including healthcare expenditures, reduced productivity, missed school days, and other opportu-

shrinking saline lakes highlight the potential magnitude of the problem.

For example, the Salton Sea's decline has led to severe issues such as increased airborne dust and degraded air quality, as well as harmful algal blooms, resulting in estimated public health costs of approximately $40 billion.[43] Moreover, respiratory-related emergency room visits increased for children in the area, with childhood asthma hospitalization rates measured at three times the state average.[44] Importantly, Salton Sea is located in a relatively remote region with approximately 650,000 people living in its watershed,[45] whereas the Great Salt Lake watershed is home to nearly three million people.[46] Given the vastly larger population at risk, the health-related costs associated with airborne dust and declining air quality due to Great Salt Lake's decline are likely to exceed those observed at Salton Sea by a significant margin.

Several other ailing saline lakes, such as Lake Urmia, Aral Sea, Owens Lake, and Mono Lake, have also demonstrated significant public health impacts from airborne dust containing fine particulate matter like PM_{10} and $PM_{2.5}$.[47] Around the Aral Sea, communities have reported elevated rates of esophageal cancer, respiratory illnesses, and eye conditions due to the worsening air quality.[48] The severe and costly health consequences observed in these regions underscore the risks associated with a shrinking Great Salt Lake, impacting the economy and presenting material implications for health insurance providers and public health systems alike.

In addition to these public health hazards, Great Salt Lake impacts another sector tied to the region's economic stability: snowpack. The shrinking lake affects regional snowpack through two distinct mechanisms, fundamentally altering the region's winter precipitation patterns in the form of snow. As the exposed lakebed expands, increased dust deposition on mountain snowpack accelerates melt rates through decreased albedo effects,[49] systematically shortening the snow season.[50] Simultaneously, the lake's diminished surface area reduces lake-effect snow generation, potentially decreasing average annual snowpack by 5.1% to 8.4%.[51]

Research has shown that when the lake shriveled to its lowest point in 2022, the ski season decreased by two weeks.[52] Utah relies heavily on snowfall for not only the economy, but habitability, as the state receives 95% of its water through snowpack.[53] This dual erosion of snow conditions impacted by Great Salt Lake's reduced elevation translates into substantial economic impacts.[54]

On a smaller scale, the recreational use value from the downhill ski industry would decline along with the lake, resulting in annual ski resort losses.[55] These estimates do not account for other snow-based recreation activities, such as snowmobiling, backcountry skiing, and more.[56] Utah's globally recognized snow-based recreation is vital to its

nity costs, citing specific adverse health outcomes totaling $498,014,124 in emergency department visit costs and $223,552,720 in hospital admissions expenses. *Id.*

43. Great Salt Lake Advisory Council, *supra* note 29, at 40-41; Cohen, *supra* note 42, at 12-19 (estimating that public health costs of failing to meet federal standards are between $23 and $40 billion).
44. Michael J. Cohen & Karen H. Hyun, Pacific Institute, Hazard: The Future of the Salton Sea With No Restoration Project 33 (2006).
45. Cohen, *supra* note 42, at 11; *Salton Sea Partnership*, Water Found. (July 9, 2020), https://waterfdn.org/salton-sea-partnership/.
46. Steed, *supra* note 4, at 11 (noting that the population in the Great Salt Lake watershed is estimated to drastically increase to 4.6 million residents by 2060); *see also* Jim Davis et al., Utah Geological Survey, Commonly Asked Questions About Utah's Great Salt Lake and Ancient Lake Bonneville 1 (2d ed. 2022).
47. *See* Grineski et al., *supra* note 19.
48. *See, e.g.*, Anchita et al., *Health Impact of Drying Aral Sea: One Health and Socio-Economical Approach*, 13 Water 22 (2021); Philip Micklin, *The Aral Sea Disaster*, 35 Ann. Rev. Earth & Planetary Sci. 47 (2007).
49. The "albedo effect" on snowpack refers to snow's reflectivity. Snow with a high albedo reflects most sunlight, while snow with a low albedo typically has dust or dirt in it, causing it to absorb more sunlight and melt faster. Dorothy K. Hall et al., *The Role of Declining Snow Cover in the Desiccation of the Great Salt Lake, Utah, Using MODIS Data*, 252 Remote Sensing Env't 112106 (2021) ("An expanding dry lake bed is a major source of dust pollution and can accelerate snowmelt in the nearby mountains when dust is blown onto the snow, reducing the albedo of the snow surface and allowing greater absorption of solar radiation." (citations omitted)).
50. Otto I. Lang et al., *The Shrinking Great Salt Lake Contributes to Record High Dust-on-Snow Deposition in the Wasatch Mountains During the 2022 Snowmelt Season*, 18 Env't Rsch. Letters 064045 (2023) (reporting that dust emitted from the exposed Great Salt Lake lakebed led snowmelt to occur more than two weeks earlier than without dust, and the impact could have been more dramatic if spring storms did not bury dust layers); Hall et al., *supra* note 49 ("In the [Great Salt Lake] basin, the snowpack was melting on average ~9.5 days earlier between [water year] 2001 and 2018 . . . .").
51. Great Salt Lake Advisory Council, *supra* note 12, at 65; Kristen N. Yeager et al., *Contributions of Lake-Effect Periods to the Cool-Season Hydroclimate of the Great Salt Lake Basin*, 52 J. Applied Meteorology & Climatology 341 (2013); Great Salt Lake, *Industry & Recreation*, https://greatsaltlake.utah.gov/industry-recreation (last visited Feb. 21, 2025) (finding that Great Salt Lake "contributes 5-10% to Utah's famous snow and extends the ski season by 5 to 7 weeks").
52. Lang et al., *supra* note 50.
53. Utah Division of Water Resources, *Snowpack*, https://water.utah.gov/snowpack/ (last visited Feb. 21, 2025).
54. The declining lake is projected to result in annual statewide spending losses ranging from $5.8 to $9.6 million. Great Salt Lake Advisory Council, *supra* note 12, at 66-68. This may underestimate the true economic impacts from a reduced snowpack in Utah. *See* Emily J. Wilkins et al., *Climate Change and Utah Ski Resorts: Impacts, Perceptions, and Adaptation Strategies*, 41 Mountain Rsch. & Dev. R12 (2021) (finding that "statewide analyses have found that winters with particularly high levels of snow contributed an additional US$ 49 million to [Utah's] economy, while low-snow years resulted in a 7% decrease in skier visits and a loss of US$ 53 million to the Utah economy").
55. Annual recreational use value losses from the declining Great Salt Lake were projected by a government contractor to be between $1.8 million and $3.0 million. Great Salt Lake Advisory Council, *supra* note 12, at 67. This may underestimate the true loss of recreational use value from a declining snowpack. *See* Wilkins et al., *supra* note 54 (reporting "low-snow years resulted in a 7% decrease in skier visits and a loss of US$ 53 million to the Utah economy"). Utah's 2016-2017 winter had an above-average snowpack, whereas its 2017-2018 winter was well below average. Utah skier days dropped nearly 10% between the two winters. Jennifer Leaver, Kem C. Gardner Policy Institute, The State of Utah's Travel and Tourism Industry, 2024, at 9-10 (2024), https://www.discovermoab.com/wp-content/uploads/2024/02/TT-Report-Feb2024.pdf.

    Several Utah ski resorts have expressed concerns about the shrinking Great Salt Lake and the adverse impacts it will have on the ski industry. In February 2023, Snowbird and The Nature Conservancy co-hosted a presentation titled "Dust on Powder: Saving the Great Salt Lake and the Greatest Snow on Earth," where Snowbird's sustainability and water resources director stated that Snowbird is "intrinsically tied and directly impacted by what happens to the Great Salt Lake." Hilary Arens, *Science, Skiing & Dust*, Snowbird (Mar. 8, 2023), https://www.snowbird.com/blog/nature-conservancy-recap/ (minutes 1:01-1:06).
56. Great Salt Lake Advisory Council, *supra* note 12, at 66.

economy, and the declining water levels in Great Salt Lake directly adversely affect the industry.

3. Transformative Regional Economic Trajectory

One of the most profound economic consequences posed by Great Salt Lake's decline is its potential to fundamentally reshape the region's long-term economic trajectory. Dust from a shrinking lake could accelerate outmigration, reduce business attraction, and make employee retention increasingly difficult,[57] presenting severe challenges for Utah's economic future. The loss of environmental quality and diminished quality of life can serve as a powerful deterrent for business, particularly in industries such as technology, finance, and professional services, where employee and environmental well-being are central to siting decisions.[58] These sectors favor regions with strong environmental assets, recognizing its role in work force satisfaction. As air quality worsens and the region's habitability declines, Utah may experience a slowdown in economic growth compared to its potential under more favorable environmental conditions.[59]

Environmental degradation, as seen in heavily polluted regions worldwide, can trigger self-perpetuating cycles of economic downturn. Executive recruitment firms report growing challenges in attracting talent to regions with poor air quality, with candidates increasingly citing environmental factors as decisive considerations in their employment decisions.[60] Maintaining a work force in areas with high levels of pollution is also proving more difficult.[61] Technology and professional service companies increasingly factor environmental conditions into their location siting decisions, with air quality and local climate resilience emerging as important factors that can influence whether a company establishes operations in a particular area.[62]

These dynamics carry special significance for Utah's aspirations as a technology hub.[63] Utah's outdoor recreation has ranked as one of the most important factors for tech companies to either relocate or remain in the state, whereas poor air quality and degrading environmental conditions are top reasons that might drive tech companies and employees out of the state.[64]

Quality of life plays an impactful role on business and the economy, as evidenced by other regions of the world.[65] As Great Salt Lake declines, companies with a large presence in the region face material risks from a degrading quality of life.[66] These impacts suggest that traditional economic and market analyses may drastically underestimate the true stakes of Great Salt Lake's declining levels, as the implications of an ailing lake threaten to trigger cascading effects that could fundamentally reshape local and regional economic vitality. The economic impacts described above

57. *See, e.g.*, Wangyang Lai et al., *Air Pollution and Brain Drain: Evidence From College Graduates in China*, 68 China Econ. Rev. 101624 (2021) (finding that cities with heavier air pollution in China lose more college graduates and that outmigration is most extreme among highly and elite-educated talented professional employees); Elisa Lanzi et al., *The Sectoral and Regional Economic Consequences of Outdoor Air Pollution to 2060*, 71 Energy Econ. 89 (2018) (finding that, generally, the costs of inaction of outdoor air pollution will lower gross domestic product by an average of 1% by 2060, and labor productivity will suffer because of the indirect impact of worsening health); Catherine J. Reilly & Henry Renski, *Place and Prosperity: Quality of Place as an Economic Driver*, 17 Me. Pol'y Rev. 12, 20 (2008) ("Most studies find that areas with high levels of quality-of-place factors also have higher rates of population and employment growth.").
58. Great Salt Lake Advisory Council, *supra* note 12, at 77; *see also* Reilly & Renski, *supra* note 57, at 20-22.
59. Great Salt Lake Advisory Council, *supra* note 12, at 77-78.
60. For example, in 2015, the American Chamber of Commerce in China reported that a majority of organization respondents reported difficulties in recruiting senior executives to work in China due to air quality and pollution issues. American Chamber of Commerce in the People's Republic of China, China Business Climate Survey Report 23 (2015), https://media.bain.com/Images/REPORT_China_Business_Climate_Survey_Report_2015.pdf; *see also* Money Watch, *Execs Fleeing China Because of Bad Air*, CBS News (Apr. 30, 2013), https://www.cbsnews.com/news/execs-fleeing-china-because-of-bad-air/.
61. *See* Lisa L. Love & John L. Crompton, *The Role of Quality of Life in Business (Re)Location Decisions*, 44 J. Bus. Rsch. 211 (1999) (explaining that "footloose companies"—those whose financial performance is relatively independent of location decisions because they are not tied to raw materials, natural resources, etc.—rank quality of life as being significantly more important than non-footloose companies when deciding where to locate or relocate); Xin Deng & Huasheng Gao, *Nonmonetary Benefits, Quality of Life, and Executive Compensation*, 48 J. Fin. & Quantitative Analysis 197 (2013) (finding that the geographic desirability of a corporation's headquarters is an effective substitute for chief executive officer (CEO) monetary pay, and companies that are located or choose to locate in areas with pollution pay higher compensation to CEOs than companies in more livable locations); Li Wang et al., *Air Pollution and Employee Treatment*, 70 J. Corp. Fin. 102067 (2021) (finding that "several well-known global companies are willing to pay a wage premium or provide enhanced employee-care welfare to compensate for unpleasant locations," citing examples ranging from "Panasonic's 'pollution subsidy'" to "[t]he Coca-Cola Company's 'environmental hardship allowance'").
62. *See, e.g.*, Amy Bailey & Laura Brush, The Resilience Factor: A Competitive Edge for Climate-Ready Cities, Center for Climate and Energy Solutions (Oct. 2020) (explaining the interconnected nature of a city's climate resilience and its economic competitiveness); Terry L. Besser & Nancy J. Miller, *Social Capital, Local Businesses, and Amenities in U.S. Rural Prairie Communities*, 32 J. Rural Studies 186 (2013) (discussing how footloose employees, businesses requiring their skills, and entrepreneurs will move to areas with a high quality of life).
63. For instance, Silicon Slopes is an organization guided by leaders in Utah's tech and business industries. Silicon Slopes, *About Silicon Slopes*, https://newsroom.siliconslopes.com/about/ (last visited Feb. 21, 2025). Silicon Slopes has advocated for clean air and acknowledged the adverse implications posed by poor air quality to the technology and business industries in Utah. The organization has promoted efforts to reduce emissions, stating that:
> air quality is as much a business and economic development issue as it is an environmental one. Our spectacular natural environment is one of the major reasons Utah is the best place to live, work, learn, and play, and we know many companies and employees choose to locate and stay here for this reason.

Bailey Bowthorpe, *A Year-Round Commitment to Clean Air*, Silicon Slopes (Apr. 10, 2019), https://newsroom.siliconslopes.com/a-year-round-commitment-to-clean-air/. While Silicon Slopes' advocacy for clean air has largely been evidenced through efforts to reduce emissions, air quality issues in Utah will not be resolved without discussion of and aid toward the declining Great Salt Lake.
64. Marin Christensen, Kem. C. Gardner Policy Institute, Utah Outdoor Partners Survey of Tech Sector Employees 1-3, 20, 22-25 (2021), https://d36oiwf74r1rap.cloudfront.net/wp-content/uploads/Utah-Outdoor-Partners-Survey-Jan2021.pdf?x71849; Point of the Mountain Development Commission, Point of the Mountain Visioning Process Phase One Report Executive Summary May 2017, at 16, 18 (2017), https://le.utah.gov/interim/2017/pdf/00002342.pdf (finding that air quality is the top reason employees might leave Utah, and reducing air pollution is one of the top two desired changes for Point of the Mountain and Silicon Slopes area).
65. *See, e.g.*, Love & Crompton, *supra* note 61; Reilly & Renski, *supra* note 57, at 20-22.
66. Great Salt Lake Advisory Council, *supra* note 12, at 76-78.

illustrate a progressive expansion of material risk as lake levels continue to decrease.

II. Great Salt Lake as a Bellwether for Other Environmental Crises

The crisis unfolding at Great Salt Lake illustrates the far-reaching risks posed by environmental crises, and underscores how localized challenges can escalate into broader disruptions. Described as a "potential environmental nuclear bomb" in waiting, the lake's dramatic decline exemplifies how overconsumption and climate change can destabilize ecosystems, economies, and communities.[67] The shrinking lake reveals a pattern likely to repeat in other contexts where environmental crises progressively expand both the financial risks to regional businesses and corresponding securities disclosure obligations.

While the specifics of Great Salt Lake's decline are unique, its challenges mirror broader environmental crises worldwide. From drought and groundwater depletion to wildfires, flooding, and salt water intrusion, these challenges reveal the fragile interdependence between natural systems and the communities that depend on them, along with insufficient tools to adequately address the causes of these crises, particularly over the short run. The lake's plight exemplifies how environmental challenges can generate material risks that impact market systems, creating the need for proactive strategies to mitigate risks before they escalate along with a full understanding of approaches to risk assessment and disclosure liability.

The faces of environmental crises are many, but we lay out a few of the most common below. Drought exemplifies one of the most pressing environmental challenges: the growing strain on water resources, particularly when exacerbated by climate change, population growth, and overconsumption. The poster child of drought over the past few decades has been the Colorado River. The river—spanning seven states and two nations—sustains nearly 40 million people and 30 federally recognized tribes, while supporting agriculture through irrigating 5.5 million acres of land, generating power for millions of people, providing habitat for a wide range of species, and supporting a $26-billion recreation and tourism industry. Yet chronic overuse and climate-driven shifts in precipitation patterns have pushed this vital resource to the brink, jeopardizing water security, habitability, and economic stability across the Southwest.

Similarly, groundwater depletion, driven by overextraction and worsening droughts, is depleting critical aquifers faster than they can be replenished. The Ogallala Aquifer, which slowly grew over millennia, spans eight High Plains states and supports one of the most agriculturally productive regions in the world, is being consumed at rates far exceeding its ability to replenish. This depletion of the aquifer imperils not only the local economy and livelihoods, but also global food supply chains, with more than $20 billion in agricultural output at stake.

The growing frequency and severity of wildfires illustrate another dimension of escalating environmental crises. Rising temperatures and prolonged drought have intensified wildfire seasons across the United States and beyond, with population growth in fire-prone areas compounding vulnerabilities. Wildfires, fueled by rising temperatures and extended fire seasons, are another manifestation of escalating environmental crises. Meanwhile, insurers are increasingly retreating from fire-prone markets such as California, leaving property owners without financial protection and further compounding the crisis.

Increased flooding presents yet another environmental challenge as climate change drives heavier rainfall events that overwhelm aging infrastructure, which remains inadequate to manage the escalating frequency and severity of extreme weather events. In states such as Louisiana and Florida, severe flooding damage has driven insurers to exit flood-prone areas entirely. Without coverage, communities are left to bear the financial burden of rebuilding, perpetuating cycles of economic vulnerability.

The patterns revealed through these environmental crises create an urgent need to comprehend and address environmental risks. Understanding these crises proves essential for developing more effective approaches to environmental risk assessment and disclosure.

As environmental pressures mount globally, the lessons emerging from Great Salt Lake's crisis take on urgency. The lake's trajectory illuminates how the combined pressures from resource overuse, climate change, and ecosystem degradation converge to create liabilities that demand careful attention from policymakers and market participants alike. Recognizing these patterns of environmental transformation is essential for understanding how environmental crises create expanding circles of material risk that demand careful attention from market participants, while also fostering resilience in an era defined by accelerating change.

III. Securities Disclosure Law and Great Salt Lake

If the lake continues to dry up, the systemic economic risks associated with recession of Great Salt Lake discussed in preceding sections will eventually trigger material disclosure requirements for publicly traded companies in affected industries or with a large economic footprint in the geographic region.[68] In 2024, responding to sustained investor demand for greater transparency regarding environmen-

67. Flavelle, *supra* note 1.

68. *See generally* Joey Tsu-Yi Chen, *Green SOX for Investors: Requiring Companies to Disclose Risks Related to Climate Change*, 5 J. Bus. & Tech. L. 325 (2010) (discussing climate change disclosure risks much prior to any SEC-specific climate change disclosure rulemakings); Sally R.K. Fisk & Nikki Adame-Winningham, *Sustainability Risk Is Investment Risk*, 50 ELR 10644 (Aug. 2020), https://www.elr.info/articles/elr-articles/sustainability-risk-investment-risk (discussing the force of bedrock SEC law requiring disclosure of material environmental risks even absent the Joseph Biden Administration's climate change disclosure rules); Thomas Marts, *SEC Proposed Climate Disclosures: Preparing for a New Era of Climate Litigation in Idaho and Beyond*, 60 Idaho L. Rev. 91 (2024) (examining how the SEC's new climate change rules expand climate disclosure requirements and discussing how these new rules built upon preexisting obligations).

tal risks, the U.S. Securities and Exchange Commission (SEC) adopted the Enhancement and Standardization of Climate-Related Disclosures for Investors (the "Final Rule").[69] Presently on hold due to litigation challenges[70] and the change in presidential administration,[71] this Final Rule aimed to both standardize and expand the content and communication of the potential financial effects and corresponding mitigation strategies related to material climate-related risks by public companies and in public offerings.[72]

However, the disclosure of environmental risks is by no means a new invention. The Securities Act of 1933 and the Securities Exchange Act of 1934 together mandate the disclosure of facts and circumstances that "are reasonably likely . . . to have a material impact on future operations," or may "make an investment in the registrant or offering speculative or risky."[73] Subsequently, correspondent to increasing investor demand, the SEC has issued several interpretative releases to clarify and strengthen the intent of these regulations as they pertain to environmental disclosures.

In the sections that follow, we first provide an overview of the application of existing SEC laws and interpretations to climate-risk disclosures. We next contextualize the expanded disclosure obligations under the Final Rule relative to existing guidelines, and discuss the ongoing legal and political challenges to the rule. We conclude with a commentary on the extent to which the continued deterioration of Great Salt Lake may trigger environmental risk disclosure for impacted firms and municipalities under these regulations.

A. *Securities Laws of Particular Concern*

1. Regulation S-K Item 105—Material Risk Factors

Item 105 requires "a discussion of the material factors that make an investment in the registrant or offering speculative or risky" to be included in registrant offerings and periodic reports.[74] The discussion must "explain how each risk affects the registrant or the securities being offered."[75] The SEC does not have an enumerated list of risk factors that must be disclosed.[76] Rather, it "encourage[s] registrants to provide risk disclosure that is more precisely calibrated to their particular circumstances and therefore more meaningful to investors."[77]

For firms whose business model is directly tied to the health of Great Salt Lake, such risks are clearly "calibrated to their particular circumstances," and therefore must be given careful consideration regarding their materiality. In its 2010 interpretative release titled Commission Guidance Regarding Disclosure Related to Climate Change, the SEC suggests that the materiality of climate change is multifaceted, encompassing "legislative, regulatory, business and market impacts," and notes that its effects reach beyond companies directly affected to those "indirectly affected by changing prices for goods or services provided by companies that are directly affected."[78] Thus, the continued deterioration of Great Salt Lake is likely to trigger disclosure obligations for more than just the subset of firms experiencing direct industrial impacts.

Many industries will need to disclose to investors company-specific risks associated with Great Salt Lake's failure. An ailing lake progressively draws more sectors into disclosure territory. What begins as a modest reporting concern for businesses directly reliant on the lake's ecosystem could evolve into a situation in which more businesses are impacted. It is hard to imagine if the lake continues to dry up, how, for example, any industry that works directly on the lake—ranging from lake-water mining operations to brine shrimp harvesters—can avoid devastating business impacts.

If Great Salt Lake's dried lakebed continues to expand and break down, resulting in severe air quality challenges for the region, how could this not act as a barrier to industries reliant on coaxing highly desirable employees to come to Utah or even to stay? If dust deposits continue to accelerate snowmelt, how could Utah's ski and tourism industry not suffer? What will become of the investments in real estate in the region, let alone to the mortgage lenders active in the area? The further the lake is pushed toward ecological collapse, the broader and more severe the impacts become, and consequently, the larger the number of entities that will have to provide disclosures and the more damaging those disclosures will prove.

69. The Enhancement and Standardization of Climate-Related Disclosures for Investors, Release Nos. 33-11275; 34-99678, 17 C.F.R. §§210, 229, 230, 232, 239, 249 (2024), https://www.sec.gov/files/rules/final/2024/33-11275.pdf [hereinafter Final Rule].

70. *See* Iowa v. Securities & Exchange Comm'n, No. 24-1522 (8th Cir. filed Mar. 6, 2024); Liberty Energy Inc. v. Securities & Exchange Comm'n, No. 24-cv-739 (N.D. Tex. filed Mar. 6, 2024).

71. On February 11, 2025, acting Chairman Mark Uyeda directed the SEC staff to request the U.S. Court of Appeals for the Eighth Circuit not to schedule the case for argument on the climate-related disclosure rules until the SEC determines the appropriate next steps and whether it wants to continue defending the rules. *See infra* notes 106-07 and accompanying text. *See also* Michael B. Gerrard, *Environmental Law in Trump's Second Term*, N.Y. L.J. (2024), *available at* https://scholarship.law.columbia.edu/faculty_scholarship/4578/?utm_source=scholarship.law.columbia.edu%2Ffaculty_scholarship%2F4578&utm_medium=PDF&utm_campaign=PDFCoverPages.

72. Press Release, SEC, SEC Adopts Rules to Enhance and Standardize Climate-Related Disclosures for Investors (Mar. 6, 2024), https://www.sec.gov/newsroom/press-releases/2024-31.

73. 17 C.F.R. §229.303.

74. *Id.* §229.105.

75. *Id.*

76. *See* Fast Act Modernization & Simplification of Regulation S-K, Release Nos. 33-10618; 34-85381, 84 Fed. Reg. 12674 (Apr. 2, 2019) (codified at 17 C.F.R. pts. 229, 230, 232, 239, 240, 249, 270, 274, 275), https://www.federalregister.gov/documents/2019/04/02/2019-05695/fast-act-modernization-and-simplification-of-regulation-s-k (explaining that the "elimination of the specific examples of material risks" previously found in Item 503(c) aligned with the SEC's goals by "seek[ing] to encourage registrants to focus on their own risk identification processes").

77. *Id.*

78. Commission Guidance Regarding Disclosure Related to Climate Change, Release Nos. 33-9106; 34-61469; FR-82, 75 Fed. Reg. 6295 (Feb. 8, 2010) (codified at 17 C.F.R. pts. 211, 231, 241), https://www.sec.gov/files/rules/interp/2010/33-9106.pdf.

2. Regulation S-K Item 303—Management's Discussion and Analysis

Item 303 of Regulation S-K encompasses a broad range of disclosures intended to supplement the financial statements with management's subjective discussion and analysis (collectively termed MD&A) of both historical and forward-looking facts and trends. While there are numerous prescriptive disclosures under MD&A, much of the required disclosure under MD&A is principles-based and requires a subjective materiality determination by management.

Of particular relevance to the context of climate-related risk disclosures, the SEC has asserted that Item 303 requires disclosure of any "known trend or uncertainty that is reasonably likely to have a material effect on the registrant's financial condition or results of operations."[79] Importantly, the SEC has clarified that "reasonably likely" constitutes a "lower threshold than more likely than not" but is higher than "remote."[80]

This lower threshold only hastens the time disclosure is necessary. As the current state of Great Salt Lake brings into focus the likely economic consequences associated with its decline, we believe that it will be increasingly difficult to assert that such risks do not rise to the level of required disclosure. Many market players may have already passed the threshold where the "reasonably likely" impacts have already materialized. Unless we can reverse the trajectory of the lake, the number of industries affected and types of disclosures required are only going to grow.

3. Assessments of Materiality and Failure to Disclose

All SEC disclosure requirements are subject to a materiality determination. From a legal vantage, the subjectivity of such determination may potentially expose firms affected by Great Salt Lake to future securities litigation risk if climate-related risks are inadequately disclosed. In *TSC Industries, Inc. v. Northway, Inc.*, the U.S. Supreme Court held that a fact may be considered "material" if "there is a substantial likelihood that a reasonable shareholder would consider it important in deciding how to vote."[81]

Put another way, if "the omitted fact would have assumed actual significance in the deliberations of the reasonable shareholder," it is material.[82] In a separate case, the Supreme Court explained that "materiality will depend at any given time upon a balancing of both the indicated probability that the event will occur and the anticipated magnitude of the event in light of the totality of the company activity."[83]

Additionally, the U.S. Court of Appeals for the Tenth Circuit has adopted a two-step test for materiality specifically for Items 105 and 303 of SEC Regulation S-K: "[A] duty to disclose arises 'where a trend, demand, commitment, event or uncertainty is both [1] presently known to management and [2] reasonably likely to have material effects on the registrant's financial condition or results of operations.'"[84] Further, "[a] company must . . . disclose a relevant risk if that risk had already begun to materialize."[85]

Such legal definitions suggest that potential legal liability can accrue to firms for failure to disclose substantive environmental risks that subsequently materialize. Specifically, the Supreme Court has long held that "silence in connection with the purchase or sale of securities may operate as a[n actionable] fraud" so long as a duty to disclose existed.[86]

Additionally, §302 of the Sarbanes-Oxley Act of 2002 contains provisions that require executives to certify the completeness and accuracy of filings and establish significant criminal and financial penalties for the certification of inaccurate or misleading disclosures. Penalties for certifying false or inaccurate statements include a fine of up to $1 million and a prison term of up to 10 years, and a willful violation can lead to penalties of up to $5 million and a prison term of up to 20 years.[87] Thus, in addition to firm-level risk, executives of Great Salt Lake-affected firms may incur substantial personal liabilities when climate-related risk disclosures are deemed inadequate.

B. Current Developments: SEC 2024 Final Rule Changes and Ongoing Legal Challenges

As noted above, on March 6, 2024, the SEC issued the Final Rule,[88] which updates and expands existing disclosure requirements pertaining to the disclosure of material climate-related risks. The Final Rule is intended to both standardize and enhance environmental disclosures in response to heightened investor demand for "consistent, comparable, and reliable information about the financial effects of climate-related risks on a registrant's operations."[89] The Final Rule has garnered significant political debate—proposals gained more than 24,000 public comments[90]—and the ultimate implementation is subject to significant uncertainty pending the resolution of ongoing legal and political challenges, including those from dissenting SEC

79. Management's Discussion and Analysis, Selected Financial Data, and Supplementary Financial Information, Exchange Act Release No. 33-10890, 86 Fed. Reg. 2080 (Feb. 10, 2021) (codified at 17 C.F.R. pts. 210, 229, 230, 239, 240, 249), https://www.sec.gov/files/rules/final/2020/33-10890.pdf.
80. Division of Corporate Finance, SEC, Financial Reporting Manual 9220.11 (2022), https://www.sec.gov/files/cf-frm.pdf.
81. 426 U.S. 438, 449 (1976).
82. *Id.*
83. Basic Inc. v. Levinson, 485 U.S. 224, 238 (1988).
84. Indiana Pub. Ret. Sys. v. Pluralsight, Inc., 45 F.4th 1236, 1269 (10th Cir. 2022) (citations omitted).
85. *Id.* at 1256 (citing Karth v. Keryx Biopharms., Inc., 6 F.4th 123, 138 (1st Cir. 2021)).
86. *See* Chiarella v. United States, 445 U.S. 222, 230 (1980).
87. 18 U.S.C. §1350(c) (2002).
88. Final Rule, *supra* note 69.
89. Press Release, SEC, *supra* note 72.
90. *See* Jessica B. Magee et al., *SEC Adopts Landmark Climate Disclosure Rules*, Holland & Knight (Mar. 11, 2024), https://www.hklaw.com/en/insights/publications/2024/03/sec-adopts-landmark-climate-disclosure-rules.

commissioners. These ongoing challenges and their implications for the viability of the Final Rule are discussed in the sections that follow.

As articulated in the prior section, existing regulations already create significant disclosure obligations for Great Salt Lake-affected firms that will become increasingly more urgent as deterioration continues. In this section, we further explore how those obligations may be expanded if the Final Rule is ultimately upheld.

1. 2024 SEC Final Climate-Related Disclosure Rule

The Final Rule added new sections to both Regulation S-K (Items 1500-1508) and Regulation S-X (Rule 14). Within these additions, Items 1500-1503 are most directly applicable to the disclosures surrounding Great Salt Lake or similar environmental crises. Importantly, the underlying crux of these regulatory requirements in these provisions mirrors preexisting disclosure requirements, but significantly increases the specificity and prescriptiveness of required elements for climate-related risks under Regulation S-K's existing "material risk" disclosure provisions.

The SEC contended that while such disclosure obligations may already be generally includable under existing regulation, clarification and expansion of related scope and definitions pertaining to climate risk specifically were necessary to ensure disclosures were sufficiently complete and informative to investor decisions. Thus, while the Final Rule also reiterates prior regulatory requirements that climate-related risks with expected material impacts trigger disclosure obligations, we discuss below the key provisions that dramatically expand upon the scope of those previous disclosure requirements.

Item 1500 together with Item 1502(a) specifically require disclosure and define what is within the scope of disclosable climate-related risks, as those "actual or potential negative impacts of climate-related conditions and events on a registrant's business, results of operations or financial condition."[91]

Item 1502(b)-(c) further expands the scope of qualitative factors to be considered, specifying that for each risk identified, management must further assess not only the current but also the potential future effects of those risks on the registrant's strategy, business model, and outlook, as well as such potential future effects as are factored into current strategic, operational, or financial decisions. This prompts registrants as to the comprehensive nature of impacts that should be considered—specifically (but not exhaustively) the SEC references implications for a company's strategy, operations, and business model for geographic presence, product market, supply chain, technological requirements, and research and development-related adjustments. These disclosures are intended to help investors discern the influence of climate-related impacts on the future evolution of the business as well as to provide information necessary to evaluate the potential resilience of business models to these risks.[92]

Item 1502(d) explicitly specifies that registrants must disclose how climate-related risks, as described in Item 1502(a), "have materially impacted or are reasonably likely to materially impact the registrant's business, results of operations, or financial condition."[93] In addition, Items 1501 and 1503 outline disclosure obligations related to board governance responsibilities and related internal processes corresponding to the identification and management of climate-related risks.[94]

Finally, Rule 14 mandates disclosure in the financial statements of *current effects* related to "severe weather events and other natural conditions." These seem particularly applicable to the challenges facing Great Salt Lake. Minimally, it should prompt a fuller evaluation of the current economic costs associated with ongoing environmental conditions.

As it pertains to Great Salt Lake if implemented, the Final Rule emphasizes consideration of both direct and indirect effects to strategic, operational, and financial results, and would require more comprehensive assessment of risks. The Final Rule will likely be interpreted as requiring disclosure for a much broader set of affected firms, and may further prompt the reevaluation and disclosure of current governance and oversight processes in place to mitigate escalating risks.

Collectively, the new Final Rule, while grounded in the same guiding principles as existing regulation, makes explicit the contention that disclosure obligations cannot be satisfied with generic or blanket references to operational risk. Rather, the Final Rule goes further than existing regulation by clearly specifying the level of depth required for meaningful contemplation and disclosure of both direct and indirect effects to climate risk factors. Specifically, as discussed in preceding sections, firms that operate outside of directly affected industries but still have significant economic ties to the geographic region through customer or supplier relations will likely need to consider expanded disclosures as the effects of the lake's deterioration continue to spiral outward.

2. Political Controversy Regarding the Final Rule

Controversy surrounding the Final Rule has largely reflected concerns about whether it is primarily oriented toward investor disclosure needs, or whether it comprises

91. Final Rule, *supra* note 69, at 91.

92. Press Release, SEC, *supra* note 72; *see also* Final Rule, *supra* note 69, at 14.

93. Final Rule, *supra* note 69, at 854. Item 1502(d) further requires disclosure of how climate-related risk adaptation and mitigation activities may affect financial estimates or expenditures. If a company has adopted a transition plan to manage a material transition risk, Item 1502(e) requires disclosure of that plan, including quantitative and direct qualitative disclosures that must be updated annually.

94. These disclosures are only required to the extent that the registrant has internal processes in place or has formally assigned oversight responsibilities related to such risks. However, omission of such disclosures may potentially be interpreted negatively by external market participants—to the extent that investors are aware of material climate-related risks to the organization, they may rationally question the absence of dedicated management attention to the oversight and mitigation of such risks.

regulatory overreach intended to motivate firms toward greater environmental stewardship. Such disagreements are readily apparent in the unprecedented volume of comment letters received,[95] the narrow 3-2 split vote passing the Final Rule, and the articulated supporting and dissenting opinions of SEC commissioners. SEC commissioners who voted in favor of the new climate-related disclosures cite unmet investor demands for transparent disclosure of decision-relevant information necessary to judge the financial performance implications of climate-related risks for registrants' operations.[96]

By contrast, the two dissenting SEC commissioners made strong claims that the regulation was politically motivated toward a climate change agenda. They criticized the SEC's ruling as having "ventured outside of its land and set[ting] a precedent for using its disclosure regime as a means for driving social change."[97] Moreover, the dissenting commissioners expressed doubts about the benefit of regulations to investors, noting that the Final Rule would create a "flood of climate-related disclosures [that] will overwhelm investors, not inform them."[98]

The Final Rule faced similar controversy from industry and political leaders. Many congressional Democrats praised the Final Rule, while others argued it did not go far enough.[99] Conversely, congressional Republicans largely echoed the dissenting commissioners' views. Republican leaders argued that the Final Rule exceeds the SEC's authority and expertise, and will harm consumers, workers, and the economy as preparers struggle to comply.[100] GOP members introduced Congressional Review Act (CRA) challenges to the Final Rule in the U.S. House of Representatives and the U.S. Senate.[101] Both efforts stalled, and the window to repeal the Final Rule through the CRA closed in early August 2024 because 60 session days had passed since it was published in the *Federal Register*.[102]

However, the fate of the Final Rule is still highly uncertain due to the existence of ongoing litigation that has delayed its implementation. Immediately after the SEC adopted the Final Rule, numerous parties filed petitions for review in the U.S. Courts of Appeal for the Second, Fifth, Sixth, Eighth, Eleventh, and District of Columbia (D.C.) Circuits. After a lottery process, the Judicial Panel on Multidistrict Litigation selected the Eighth Circuit to hear all challenges to the SEC's Final Rule.[103] On April 4, 2024, the SEC voluntarily stayed the effective date of the Final Rule while litigation is pending.[104] The range of challenges run the gamut, from the ordinary allegation that the agency acted "arbitrarily and capriciously" under the Administrative Procedure Act to running afoul of the First Amendment, the nondelegation doctrine, and the major questions doctrine—the modern death knell of many impactful regulations.[105]

How these legal challenges play out may never be tested, however, because the 2025 transition from the Joseph Biden to Donald Trump presidential administrations has created significant political risk to the Final Rule's longevity. In February 2025, acting SEC Chairman Mark Uyeda requested a delay of oral arguments and suggested that the SEC no longer intends to actively defend the Final Rule against legal challenges.[106] This move was interpreted by many as the first step toward internal repeal of the regulation under the Trump Administration. This does not necessarily mean climate risks will not merit disclosure; rather, as Commissioner Uyeda argued forcefully at the time of the Final Rule's adoption, only those impacts that would materially alter an investor's decision ought to be the focus of SEC disclosure requirements.[107]

95. More than 14,000 comments were submitted to the SEC as part of the public comment period. Scott Hirst, *Saving Climate Disclosure*, 28 Stan. J.L. Bus. & Fin. 91, 103-04 (2023) (describing responses as including both "vociferous support, and strong opposition").
96. Fact Sheet, SEC, The Enhancement and Standardization of Climate-Related Disclosures: Final Rules (2024), https://www.sec.gov/files/33-11275-fact-sheet.pdf.
97. Statement, SEC Commissioner Mark T. Uyeda, A Climate Regulation Under the Commission's Seal: Dissenting Statement on the Enhancement and Standardization of Climate-Related Disclosures for Investors (Mar. 6, 2024), https://www.sec.gov/newsroom/speeches-statements/uyeda-statement-mandatory-climate-risk-disclosures-030624.
98. Statement, SEC Commissioner Hester M. Peirce, Green Regs and Spam: Statement on the Enhancement and Standardization of Climate-Related Disclosures for Investors (Mar. 6, 2024), https://www.sec.gov/newsroom/speeches-statements/peirce-statement-mandatory-climate-risk-disclosures-030624.
99. Complaints that the 2024 final rules were insufficient were largely in response to the SEC's elimination of the proposed disclosure of emissions throughout a company's supply chain, also known as scope 3 emissions. *See, e.g.*, Staff & Wire Reports, *SEC Climate Disclosure Rules Finally Come Out; Scope 3 Emissions Reporting Not Required*, Corp. Compliance Insights (Mar. 6, 2024), https://www.corporatecomplianceinsights.com/sec-adopts-climate-disclosure-rules/.
100. Press Release, U.S. Senate Committee on Banking, Housing, and Urban Affairs, Scott Slams SEC's Climate Disclosure Rule: "Federal Overreach at Its Worst." (Mar. 6, 2024), https://www.banking.senate.gov/newsroom/minority/scott-slams-secs-climate-disclosure-rule-federal-overreach-at-its-worst.
101. Press Release, U.S. Senate Committee on Banking, Housing, and Urban Affairs, Scott Leads Effort to Roll Back SEC's Climate Disclosure Rule (Apr. 17, 2024), https://www.banking.senate.gov/newsroom/minority/scott-leads-effort-to-roll-back-secs-climate-disclosure-rule; *see also* Lamar Johnson, *Window to Repeal SEC Climate Disclosure Rule Closes*, Util. Dive (Aug. 5, 2024), https://www.utilitydive.com/news/cra-window-closed-sec-climate-risk-disclosure-2024 Final Rule/723270/.
102. Johnson, *supra* note 101.
103. *U.S. SEC Climate Disclosure Rules Spark Flurry of Litigation*, Jones Day (June 4, 2024), https://www.jonesday.com/en/insights/2024/06/us-sec-climate-disclosure-rules-spark-flurry-of-litigation.
104. *SEC Voluntarily Stays Its Climate Rules Pending Judicial Review*, White & Case (Apr. 9, 2024), https://www.whitecase.com/insight-alert/sec-voluntarily-stays-its-climate-rules-pending-judicial-review.
105. Donna M. Nagy, *The SEC and "Major Questions Doctrine" Questions*, 26 U. Pa. J. Bus. L. 1142, 1156-57 (2024); Sarah Grey & Paul Nabhan, *The SEC Stayed Its New Climate-Related Disclosure Rule. Now What?*, 55 ABA Trends 4 (July/Aug. 2024), https://www.americanbar.org/groups/environment_energy_resources/resources/trends/2024-july-august/sec-stayed-new-climate-related-disclosure-rule/. *See also* West Virginia v. Environmental Prot. Agency, 597 U.S. 697, 724 (2022); David A. Bell et al., *SEC Files Brief in Support of Climate Disclosure Rules*, Harv. L. Sch. F. on Corp. Governance (Sept. 1, 2024), https://corpgov.law.harvard.edu/2024/09/01/sec-files-brief-in-support-of-climate-disclosure-rules/.
106. Statement, SEC Acting Chairman Mark T. Uyeda, Acting Chairman Statement on Climate-Related Disclosure Rules (Feb. 11, 2025), https://www.sec.gov/newsroom/speeches-statements/uyeda-statement-climate-change-021025#_ftn4; *see also* Jeff Young, *Companies Likely to Stick With Climate Disclosure Despite SEC Rule's Demise*, Newsweek (Feb. 13, 2005), https://www.newsweek.com/sec-climate-emissions-disclosure-rule-demise-company-reactions-2030803.
107. Soyoung Ho, *Trump's SEC Takes First Step to Rescind Climate Disclosure Rule*, Thomson Reuters (Feb. 12, 2025), https://tax.thomsonreuters.com/news/trumps-sec-takes-first-step-to-rescind-climate-disclosure-rule/.

Notwithstanding, a 2025 survey suggests that many global business leaders intend to provide expanded climate-related disclosures[108] regardless of ongoing political or legal pushback.[109] Thus, at the date of writing, while there is significant uncertainty about whether and if the Final Rule will ever go into effect, there is also potential for meaningful shifts to the voluntary reporting landscape correspondent to regulatory intent. Regardless of what happens with the SEC Final Rule, bedrock securities law still will require disclosure of material risks.

C. *Great Salt Lake's Potential Collapse Will Eventually Require Securities Disclosure*

Regardless of whether heightened disclosure provided by the SEC's Final Rule ever has the force of law, existing SEC regulations provide the principles-based guidance that suggests the need for specific disclosure about risks related to the potential demise of Great Salt Lake. While the Final Rule would, if ultimately implemented, increase the volume and specificity of required disclosures, these requirements are already looming for many market players, especially those tied to the lake. Nevertheless, it is clear that if the lake continues to deteriorate, such disclosure requirements will be, if they are not already for some market players, necessary under existing securities regulation. As discussed in Section III.B, such regulations are generally subjectively applicable based on managerial determinations of "materiality" and "reasonably likely" thresholds.

In light of mounting evidence suggesting far-reaching economic impacts associated with further decline of the lake, firms that are not currently disclosing such risks may be opening themselves up to securities law litigation and should reconsider whether such disclosures are currently warranted. The ramifications associated with the degradation of Great Salt Lake likely pose "material" risks to companies that directly rely on its ecosystem in addition to those whose large presence in the area exposes them to business risks related to population and landscape changes, or that are linked through supply chain relationships to affected firms.

These risks are well established and known. Therefore, publicly traded companies throughout Utah may need to disclose the expected economic impacts and financial risks associated with the declining water levels in Great Salt Lake regardless of the ultimate resolution of challenges to the Final Rule.

Specifically, our analyses suggest that industries that rely on the healthful ecosystem of Great Salt Lake, including mineral extraction, brine shrimp harvesting, birding tourism, and recreation at the lake, bear material direct financial and operation risks and therefore are likely material and warrant immediate disclosure. Further, indirect effects—particularly from toxic dust from the lake's exposed bed—may trigger disclosure obligations. Industries such as real estate, snow-based recreation, and health insurance, as well as companies with a significant presence in the region, while not directly impacted by the lake, are susceptible to spillover effects related to changes in the overall population and regional economic stability.

D. *Risks Related to Governmental Entities That Issue Municipal Bonds*

In addition to publicly traded entities, governmental entities that issue municipal bonds also bear significant risks associated with both the disclosure and real economic consequences of Great Salt Lake's rapid deterioration. Under §10b of the Securities Exchange Act of 1934 and Rule 10b-5, it is "unlawful for 'any person' to use or employ any manipulative or deceptive device or contrivance in connection with the purchase or sale of any security,"[110] or to "omit to state a material fact."[111] The definition of "person" includes a "government, or political subdivision, agency, or instrumentality of a government."[112]

Thus, there is an "implied private cause of action against municipalities under §10b and Rule 10b-5" that subjects municipal securities to antifraud provisions.[113] It is, therefore, unlawful for municipalities to make disclosures that "mislead investors by omitting material facts."[114] Therefore, like publicly traded entities, municipalities that fail to disclose environmental risks associated with the declining lake are potentially subject to investor recourse.

Relatedly, the purpose of these laws and regulations is to protect investors, in particular, from default risk associated with the inability of the "issuer or other obligor . . . to pay interest and principal in full."[115] The stability of the local economy is a primary factor identified by the SEC as generating default risk.[116] As demonstrated in prior sec-

108. For example, California's climate disclosure requirements may exert significant impacts on larger companies operating in Utah and beyond. California Senate Bill 261, which was signed into law in 2023, requires U.S. companies with more than $500 million in annual revenues that do business in California to prepare and publish "a climate-related financial risk report disclosing the entity's climate-related financial risk and measures adopted to reduce and adapt to climate-related financial risk." S.B. 261, ch. 383 (Cal. 2023), https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202320240SB261. This bill covers a larger universe than the proposed SEC rules because it encompasses all large companies rather than only public reporting companies under the SEC's jurisdiction. *See* Michael Gerrard & Eric W. Orts, *New California Legislation Would Be a Major Step Forward for Climate Disclosure*, Sabin Ctr. for Climate Change L. (Aug. 8, 2023), https://blogs.law.columbia.edu/climatechange/2023/08/08/new-california-legislation-would-be-a-major-step-forward-for-climate-disclosure/.

109. *Id.*

110. 15 U.S.C. §78j(b).

111. Cornell Law School Legal Information Institute, *Rule 10b-5*, https://www.law.cornell.edu/wex/Rule_10b-5 (last reviewed Jan. 2022).

112. Sonnenfeld v. City & Cnty. of Denver, 100 F.3d 744, 746 (10th Cir. 1996) (citing 15 U.S.C. §78c(a)(9)).

113. *Id.*

114. *Disclosing Risk Factors in Municipal Securities Offerings*, McCarter & English, LLP (July 20, 2023), https://www.mccarter.com/insights/disclosing-risk-factors-in-municipal-securities-offerings/; *see also Sonnenfeld*, 100 F.3d at 746-48.

115. Office of Investor Education and Advocacy, SEC, Investor Bulletin: Municipal Bonds: Understanding Credit Risk (2012), https://www.sec.gov/files/municipalbondsbulletin.pdf.

116. *Id.*

tions, the potential ramifications of a drying Great Salt Lake have significant implications for the stability of the local economy, with estimated costs between "$25.4 billion to $32.6 billion over twenty years."[117] As discussed in preceding sections, the quantification of economic costs often focuses primarily on directly affected industries. As conditions worsen, the breadth and depth of affected industries are likely to increase.[118]

Similarly, as local economic conditions decline, the stability of tax revenues is threatened, and the likelihood of significant mitigation costs is amplified, increasing the risk of municipal financial distress. In particular, municipal bond revenues are often tightly linked to property taxes, which are sensitive to the threat of disaster events as well as general environmental conditions that affect the desirability of the location.[119]

Reflecting these concerns, credit rating agencies integrate climate-related risks into municipal bond ratings,[120] which in turn increases the cost of capital for these issuers. Similarly, the Senate Budget Committee has echoed these concerns, noting that climate change can undermine the stability of municipal bond markets both through the cost side (disaster-induced spending) and the revenue side (reductions to municipal tax base), and that ignoring these risks is "akin to financial negligence."[121]

Declining water levels in Great Salt Lake may affect property values along the Wasatch Front as demand in the region is negatively affected by air pollution, job losses, and impaired aesthetics and functionality of the outdoor environment that has historically been a draw to Utah.[122] Current estimates on the impact of declining property values are "approximately $29 million per year in total for Salt Lake, Weber, and Davis Counties."[123]

E. Reputational and Economic Harm Associated With the Failure to Disclose

In addition to the regulatory and legal risks associated with a failure to disclose risks related to a failing Great Salt Lake, as discussed in the preceding sections, executives may also incur personal penalties under the Sarbanes-Oxley Act to the extent that such risks are severe enough to make the financial statements misleading. Beyond the economic costs associated with litigation, firms that fail to adequately disclose bear reputational as well as real economic risk associated with the failure to proactively discern and respond to external threats to the long-term health of the business.

Risks that are not carefully measured or articulated are unlikely to be carefully managed. More important than the disclosure itself, affected firms have a fiduciary duty to shareholders to actively manage the real economic risks associated with the deteriorating lake. Concerns associated with the drying Great Salt Lake threaten a "disaster," for both the ecosystem and the economic region—the consequences of which will be felt long before Great Salt Lake completely collapses.[124] Left unaddressed, the breadth of adversely affected industries will continue to expand, and the severity of the economic risks will escalate.[125]

In short, while a lack of risk disclosures is a concern, the consequences that underlie the need for risk disclosures are highly alarming and require great urgency. The declining water levels in Great Salt Lake pose severe threats to the economic vitality of many industries across the Wasatch Front. If the lake continues to dry, there is no silver lining for regional companies and industries. There is only one solution to ease the current risks and to stop the onset of severe economic consequences: getting more water to Great Salt Lake.

IV. Conclusion

The decline of Great Salt Lake represents an environmental crisis with profound economic, public health, and legal implications. As the lake recedes to unprecedented lows, it exposes not only its dried lakebed, but also the vulnerabilities of regional systems and legal frameworks unprepared to address such a complex fallout. The consequences of inaction when it comes to Great Salt Lake are clear, however—dust storms, collapsing ecosystems, a destabilized economy, and a region whose long-term habitability is increasingly at risk.

These risks not only have profound implications for the region, but also trigger securities law liabilities. This is because, as our discussion underscores, ecological collapse is not merely an environmental issue, but also a financial one, with real disclosure liability consequences. The failure to adequately disclose these risks could leave businesses vulnerable to legal challenges.

117. Great Salt Lake Advisory Council, *supra* note 12, at vi.
118. *Id.*
119. Erin St. Peter, *Climate-Related Muni Bond Risk: A Q&A With Breckinridge Capital Advisors*, Wharton U. Pa. (Jan. 8, 2020), https://esg.wharton.upenn.edu/news/climate-related-muni-bond-risk-a-qa-with-breckinridge-capital-advisors/; Christine S. Chung, *Rising Tides and Rearranging Deckchairs: How Climate Change Is Reshaping Infrastructure Finance and Threatening to Sink Municipal Budgets*, 32 Geo. Env't L. Rev. 165 (2019).
120. St. Peter, *supra* note 119 ("Moody's Investors Service, S&P Global Ratings and Fitch Ratings have all published pieces explaining how climate risks are integrated into their municipal credit ratings.").
121. Press Release, U.S. Senate Committee on the Budget, Whitehouse: Climate Change Is Threatening the Municipal Bond Market (Jan. 10, 2024), https://www.budget.senate.gov/chairman/newsroom/press/climate-change-is-destabilizing-the-municipal-bond-market-tune-in-as-dr-chris-hartshorn-explains-how-climate-change-is-threatening-funding-sources-that-enable-local-governments-to-invest-in-communities.
122. Great Salt Lake Advisory Council, *supra* note 12, at 44-45.
123. *Id.* at 46.
124. Nathan Frandino, *Utah's Great Salt Lake Is Drying Out, Threatening Ecological, Economic Disaster*, Reuters (July 14, 2022), https://www.reuters.com/business/environment/utahs-great-salt-lake-is-drying-out-threatening-ecological-economic-disaster-2022-07-14/.
125. Chris Jones, *Shrinking Great Salt Lake Could Be Devastating to Utah Economy*, KUTV (July 23, 2022), https://kutv.com/news/utahs-growing-pains/shrinking-great-salt-lake-could-be-devastating-to-utah-economy-million-billion-utah-state-legislature-mineral-resources-lawmakers-irreversible-wasatch-front-environment-health (estimating impact of a shrinking lake "from $1.7 to about $2 billion annually and the loss of over 5,000 jobs").

Importantly, we posit that acknowledging these risks should not be seen as a harbinger of economic doom for the region. To the contrary, it presents a compelling case—in addition to the already vital ecological, environmental, and public health arguments—for urgent action aimed at bringing the lake back. The best way to deal with these risks is not just to disclose them, but to eliminate them.

Unlike other terminal lakes that have succumbed to irreversible decline, Great Salt Lake can be brought back from the precipice. Doing so will require swift action. The window for meaningful intervention is closing rapidly, but has not yet shut. Policymakers must act decisively to implement systemic solutions that prioritize water conservation, mitigate public health risks, and stabilize the regional economy.

Let us ensure the story of Great Salt Lake is not just a cautionary tale, but a call to action for other regions facing environmental crises. It illustrates how environmental crises challenge existing legal and regulatory frameworks, including disclosure liability, while providing an opportunity to adapt. Preserving Great Salt Lake is not merely an environmental imperative, it is an economic necessity and a test of our collective ability to confront complex crises with resolve and foresight. We still can save the lake. Instead of playing any more with the sword of Damocles, let us get to work to defuse the environmental nuclear bomb.