

CHRONOLOGY of CONSTRUCTION, OPERATION, and MAINTENANCE of LAKE MERRIWEATHER and GOSHEN DAM

See acronyms, abbreviations and sources at end of chronology record



Introduction

From the chronology following this introduction, you will see that the problems of water quality, sedimentation, and dam safety are long-standing. Virginia's SWCB, DCR, DGIF, VDH, and DEQ and the U.S. EPA, USACE, and U.S. FWS have all worked very hard to try and make Goshen Dam safe and the Little Calfpasture River clean. Yet, a permanent, comprehensive and integrated solution still eludes us.

For example, in 2013, the primary state dam regulatory agency, Virginia Department of Conservation and Recreation, accepted the recommendation from the National Capital Area Council of the Boy Scouts of America (BSA) that the lake would be lowered for all of the non-camping season. This contradicted the DEQ order to maintain minimum levels to prevent sediment flushing from the lake. Also, in this instance, DCR did not require analysis of alternate management techniques for inspection, removal of debris, tree-planting, and removal of sediment to maintain lake depth that would help protect downstream water quality.

In addition, DCR approved the BSA's Emergency Action Plan without response to public comments. Even so, RACC sent comments to DCR on the Plan in July 2013, mainly expressing the need for a more effective communications plan for informing those on the river when the lake is being significantly lowered and, in the event of a flood and potential overtopping of the dam, a horn alarm. The current system of informing only the Rockbridge county emergency management office – which then issues a text message or email to those who subscribe – has proved to be ineffective and unreliable. A text or email to let people know of a dam failure in the middle of the night is not viable – especially in a rural area where cell phone and internet service are either not available or affordable for residents in the area. It is also likely unavailable to recreational users on the river.

Another state agency, the Department of Game and Inland Fisheries, oversees the Goshen-Little North Mountain Wildlife Management Area which borders the Goshen Reservation and has regulatory authority focused on wildlife impacts. As you can see in the following chronology list, the department has been involved in several efforts to help restore the Little Calfpasture River below the dam. Another fish kill would trigger DGIF enforcement; however, benthic monitoring has continually shown that healthy aquatic life cannot be supported under existing allowed conditions (Administrative Code 9VAC25-260-310, Part VII, gg.) and the river has been polluted for so long that fish to kill are likely scarce.

The Virginia Department of Health requires an annual report of the self-inspection of the wells on the six camps on the Reservation. The most recent reports showed bacterial problems by August 2014. After treatment the wells passed inspection. BSA also performs water quality tests at five locations before each camping season. The Rockbridge division of VDH is responsible for oversight of the wastewater treatment on the Reservation. Recent (2015) records show that a

gray water system built in 1999 at one of the camps was still adequate; however, in anticipation of growth, construction plans were approved for updating the system. In the inspection process, VDH discovered an unpermitted waste lagoon which was not functioning appropriately and had been leaking untreated waste into the tributaries of the Calfpasture and Little Calfpasture rivers. DEQ fined BSA \$26,000 in September 2016 and required a closure process.

In 1993, DEQ, the state agency with the primary responsibility for water quality, had issued a Notice of Violation for a fish kill in the Little Calfpasture below below Goshen Dam. This was followed by a Consent Order from the State Water Control Board requiring the BSA to implement an alternate method for draining the lake without opening the subsurface discharge or to construct a settling basin for removing sediment when using the subsurface discharge. In 1998, the SWCB revised the order to require BSA maintain a full pool, except in emergencies, and to submit quarterly reports to DEQ. In more than two decades since 1993, the existing records show inconsistent and negligent compliance. In September 2014, DEQ reported that the special Consent Order was terminated which further complicates the unresolved water quality issues in the Little Calfpasture.

The 2010 TMDL drafted by DEQ and approved by the U.S Environmental Protection Agency suggests models to help bring the Little Calfpasture back to health, but it is a voluntary document and BSA has chosen not to volunteer. DEQ says that BSA has never responded to the TMDL. After termination of the Consent Order, BSA informed DEQ of their lake management plan. The BSA plan does not include a procedure for dealing with the sediment problem. DEQ will continue ambient monitoring above and below the dam on the Little Calfpasture bi-monthly; however, they have told us (RACC) they have no plan to implement the TMDL in the near future. (*Sept 2015: On request from NBSWCD, DEQ agreed to implement the TMDL in the summer of 2016.*)

Upon asking the TMDL division of EPA and Virginia's TMDL program in October 2014 what, if anything, could be done to implement the 2010 TMDL, we were told that it was up to the U.S. Army Corps of Engineers. At the same time, the Corps reiterated that Goshen Dam is a recreational dam, not a flood control dam.

In 1979, the Corps had listed the dam as "High" hazard in accordance with the Federal dam safety guidelines. Then in August 2006, the Corps issued its *Dam Safety Evaluation Study and Final Environmental Assessment*, which recommended armoring the dam and keeping the lake at full pool. Otherwise, the Corps has informed us that its responsibility for Goshen Dam is limited to the protection of wetlands and that they have "no dog in the fight" over water quality.

In 2013, the Corps replaced the boom and conducted an engineering inspection before the construction of a new spillway. The engineering report of that visit, we are told, was done for a private party and is not available to the public. The resulting construction of a spillway dealt only with engineering safety and did not include features for water quality or aquatic wildlife passage. Subsequently, the Corps also arranged for permanent mitigation credits for a small wetland below the dam and, in 2015, contracted to have dredging of sediment behind the dam.

In addition to the many state and federal agencies who have been involved in different aspects of the problems with Goshen Dam, the Maury Service Authority (MSA), ten miles below Goshen Dam, withdraws and treats drinking water from the Maury River for Lexington and Rockbridge

county. During the last several years, the MSA has requested that BSA alert them when lowering the lake. Whenever the lake is lowered, the resulting silt turns up in the plant and has to be specially treated at extra cost. Notification would allow the MSA, at least, to anticipate and implement the needed changes to their procedures. Nevertheless, BSA continues to only inform the county emergency management office.

Although the Goshen Scout Reservation is a totally private, non-profit facility which is closed to the public, with the efforts of a Rockbridge County Supervisor a visit was arranged in 2013, and several members of RACC were able to attend. The lake is the primary element of a very desirable camping program for the 5,000 - 6,000 campers from the D.C. area who enjoy the experience of being there for 6 weeks in the summer.

The sediment accumulation in the lake, however, is an ongoing problem for the BSA. The lake is silting up despite being lowered (flushed) every year. In 2013, the average depth was 6.68 feet and the deepest portion behind the dam, 20 feet – 6 feet less than when the dam was built in 1966. For this reason, we assumed BSA would benefit by considering the options offered in the 2010 TMDL, and we invited them – by phone, emails and letters – to consider finding ways to allow the Little Calfpasture be restored. Unfortunately, we have not received any responses from the BSA, who also informed their contractor that RACC does not need information about BSA's activities.

Meanwhile, sediment discharged from Goshen Dam continues to impact water quality downstream, including Goshen Pass. In December 2014, in the Calfpasture River, which does not receive water from the dam, the rocks were obviously clean and the water clear, but in the Little Calfpasture, which receives the dam discharge, the rocks were very slippery and heavily coated.

This has been the perception and conclusions of monitoring since the fish kill in 1993. Where the Maury River begins at the confluence of the Little Calfpasture and the Calfpasture, the difference in water quality between the two tributaries is obvious from the Swinging Bridge with a muddy stream from the Little Calfpasture contrasting vividly with the clear water of the Calfpasture, and then flowing noticeably in a plume down to Goshen Pass. Trout Unlimited sponsored monitoring of the two rivers for a year, and the results are noted in the Chronology list which follows.

As a non-profit organization, BSA pays no taxes to Rockbridge County; however, we (RACC) hope there can be consideration for those who live and work in Rockbridge County, as well as for the environment. Most of the dwellings in the path of any dam breach have been there for decades before the dam was built, and their owners have important safety needs, but they also desire to have clean water in the river that passes by their houses.

In addition, local citizens consider Goshen Pass – the first area recognized for Virginia's Natural Heritage designation – to be a very special place. It is visited frequently for picnics, reunions, tubing, kayaking, swimming, birding, hiking, and for fishing and hunting year round. In addition, tourism is a major contributor to the local economy and the Pass is a very desirable tourist destination.

All 43 miles of the Maury River run through Rockbridge County and, for all the reasons described above, we need to protect it. However, as the following chronology shows, despite multiple agencies' efforts – or perhaps because of the fragmentation of regulatory authorities – the impact of Lake Merriweather and Goshen Dam on the Little Calfpasture, Maury, James, and

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Chesapeake Bay watershed continues without resolution. We (RACC) hope, however, that those delegated with the authority to protect water quality – EPA, Virginia DEQ, DCR, and VDH – will find a way to direct the process toward a comprehensive solution that ensures the protection of water quality, wildlife, human health, and the environment.

January 2017 – Sandra Stuart

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Nov 1 2016	TMDL Little Calfpasture Agricultural Working Group: discussion included ways to help with livestock exclusion in the Augusta County Correctional Center; livestock exclusion, streamside buffers, and streambank stabilization as three most important practices; funding available; a timeline for implementation; and citizen monitoring with water quality updates.
October, 2016	Question raised about USACE for dredging cost in 2015 project: Why was the dredging cost for a cubic yard \$935.48, when the annual average USACE cubic yard cost in 2015, \$23.64?
Oct 25 2016	TMDL Little Calfpasture Lake Management Working Group: discussion included efforts to clean up the illegal dump, VDACS staff working with the VA Cooperative Extension on complaints against the Augusta County Correctional Center, a presentation by the VaTech biological group on potential BMPs and strategies to reduce sediment coming out of the lake, BSA's reliance on guidance from DCR for day-to-day operation of the dam, and the function of the emergency spillway.
October, 2016	DCR: refuses to attend TMDL meetings because it might cause people to think the agency has regulatory authority over pollution issues and it does not. Saving people's lives is the main and primary goal of the Dam Safety regulations.
Sep 27 2016	TMDL Little Calfpasture Agricultural Working Group meeting: discussion included problems from the farming at the Augusta County Correctional Facility in Craigsville, illegal dumping above the lake, various BMP practices that could be applicable, and timeline for implementation.
Sep 20 2016	TMDL Lake Management Working Group meeting: water quality trends and recent changes in the lake, current management, and potential management strategies, pinpointing the sediment sources were part of the discussion.
September, 2016	NCAC-BSA agrees to pay a \$26,000 civil charge in settlement of the violations connected with the sewage lagoon discharge and to prevent all discharges of sewage from the lagoon until issued a VPDES permit, permanently close the sewage lagoon, submit an updated Application for closure plan approval that includes schedule for closure. Upon approval by DEQ, the Closure Plan and schedule becomes part of and enforceable under the terms of this Order.
August, 2016	RACC comments sent to DEQ.
Aug 2 2016	Public meeting on L.Calf TMDL held at Goshen Firehouse well attended. Comment period available to public until Aug 31. (BF)
July, 2016	DEQ advised NCAC-BSA that in order to discharge wastewater from the lagoon as proposed in the closure plan, a VPDES individual permit must be issued for the discharge.
July, 2016	RACC watershed committee sends FOIA request to USACE for information on Corps

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	recommendations, studies, emails in 2013, 2014, 2015 about Goshen Dam. (BF)
June, 2016	TMDL Little Calfpasture organizational meeting, DEQ, VaTech, NBSWCD. (BF)
May, 2016	VDH issued an operating permit to NCAC-BSA for a new septic system under Permit #HDID:181-15-0109.
May, 2016	DCR: BSA required to open the lower emergency drain once a year to make sure it works, but never for an extended period of time. Since the road over the emergency spillway is grass lined, it would require repair after usage; agency has no authority over water levels but there is no real control of water going over the emergency spillway.
May, 2016	FOIA request sent to DEQ for NCAC-BSA files. (BF)
April, 2016	Closure plan for waste lagoon (camp sewage pond) approved by DEQ/VDH. (BF)
April, 2016	RACC watershed committee: citizen monitoring request sent to DEQ for benthic monitoring of the Little Calfpasture. (BF)
April, 2016	NCAC-BSA submitted to DEQ and application for closure plan approval proposing to decant the approximated 812,515 gallons of liquid from the lagoon into either an unnamed tributary to the Little Calfpasture River or an unnamed tributary to the Calfpasture River.
March, 2016	RACC: follow-up letter to Dr. Hazel updating his information on SWPOZ in RC and questioning the value of the VDH information online for the Goshen impairment. (BF)
March, 2016	Letter from William Hazel, MD, Virginia Secretary of Health & Human Services, replying on behalf of Director Smith about the problem of E.coli, indicates that VDH intervenes in reported cases of waterborne illnesses and that DEQ is in charge of water quality. [References made to VDH website did not prove helpful for restoring water quality.] (BF)
February, 2016	DEQ: The stated VSCI score of 20.5 for the Little Calfpasture below the dam means that it can't be "dead" but that the benthic habitat has been changed and there may not be as many macroinvertebrates directly downstream of the dam as there will be with the addition of three-quarters of a mile of stream reach. The recovery stretch allows the habitat to recover, allows the aquatic population to recover, and water quality standards still have to be met on the Little Calfpasture before it flows into the Maury River."
February, 2016	RACC: follow-up letter to Director Smith requesting specific information on plans for addressing impairment of Maury River in Goshen Pass (BF)
February, 2016	VDH records for self-inspection of the wells at the six camps on the reservation (2014) pass except for bacterial problems in August, which were successfully treated. (BF)
January, 2016	Reply from Director Smith: trails rehabilitated, invasive plant inventory a priority, no mention of water quality. (BF)
January, 2016	RACC: letter to Tom Smith, Virginia Natural Preserves Program Director, requesting assistance in restoring water quality in the Pass (BF)
December, 2015	Request from BSA to expand gray water system at Olmstead Dining Hall granted by health department. Current septic system is adequate for the increase of persons from 400-500 a day. (Lex/RC DH - BF)
November, 2015	Little Calfpasture: 32 ft wide; water temp 42.3 degrees, air 50; turbidity 48 cm/12 NTU; conductivity 143.3 (CitSci.org)
November, 2015	USACE: Total cost of sediment and debris removal project – \$187,096.
November, 2015	DEQ staff met with NCAC-BSA representatives and requested a lagoon closure plan and schedule for closure, in addition to a schedule for when a new septic system would be operational.
October, 2015	Dredging of Lake Merriweather by Eastern Construction & Excavation, Inc. completed

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October, 2015	On 10/25, BSA notified DEQ that a discharge was occurring from the sewage lagoon. On 10/27, DEQ issued a NOV No. 15-10-RO-004 to NCAC-BSA for discharging sewage into state waters without a permit.
October, 2015	Little Calfpasture: 40 ft wide; water temp 62.1 degrees, air 69; turbidity 35cm/19 NTU; conductivity 192.5 (CitSci.org)
October, 2015	DEQ-VRO inspected the lagoon (10/15) and found no active discharge during the investigation. Original 1966 drawings provided by BSA indicate that the lagoon was designed and constructed with an outlet structure to receive discharge flow and direct it to a chlorine contact tank. From there, effluent was designed to flow to V-notch weir leading to a 4-inch line with an outfall to the Calfpasture River. At the time of the inspection, no chlorine supply was present. Trees and brush were growing on the berm of the lagoon and animal damage to the berm was noted.
October, 2015	VDH issues permit to NCAC-BSA to construct a PE Sewage Disposal System.
September, 2015	VDH staff notified DEQ staff of an existing sewage lagoon at the Goshen Scout Reservation. VDH did not have any record of any permits for the lagoon.
September, 2015	USACE: weather conditions force start on the sediment and debris project be moved to Oct 13, 2015
September, 2015	Little Calfpasture: 18 ft wide; water temp 74.7 degrees, air 72; turbidity 120 cm/0 NTU; conductivity 178.15. Scouts had built a beaver-style "dam" directly above monitoring site. (CitSci.org)
September, 2015	BSA reported to lowering lake to RC emergency who let MSA know, but the lowering is not reported on the emergency alert system to the 1500 people requesting to be informed. RACC requests again that BSA report directly to MSA and to those registered on the emergency alert system for dams. Emergency coordinator agrees and apologized for mistake. (BF)
September, 2015	DEQ Director replies that an IP for the Little Calfpasture River will be initiated for the summer of 2016. (BF)
August, 2015	NCAC-BSA book value of all assets at end of 2014: \$53,254,040. (CitizenAudit.org - BF)
August, 2015	Little Calfpasture: 20.5 feet wide, air temp 78 degrees, water temp 81.1 degrees; turbidity 89 cm/5NTU; conductivity 174.6 (CitSci.org)
August, 2015	NBSWCD sends letter to DEQ Director requesting that the 2010 TMDL for Little Calfpasture be implemented.
July, 2015	Little Calfpasture: 31 feet wide after rain, air temp 78 degrees, water temp 83 degrees; turbidity 78cm/ 6NTU; conductivity 159.5 (CitSci.org)
July, 2015	USACE: Precon meeting for dredging project at Goshen Dam.
June, 2015	Little Calfpasture: 26 feet wide; air temp 81 degrees, water temp 83.1 degrees; turbidity 100 cm/4 NTU; conductivity 155.9 (CitSci.org)
June, 2015	EPA, Region 3, declines to review RACC request, suggests contacting Va TMDL coordinator, who had already been contacted (see Oct 2014 above); and DCR dam safety engineer, who had already been contacted (see Nov and Dec 2014 above).
May, 2015	Little Calfpasture: 33 feet width, water temp 76.2 degrees, air 80; turbidity 96 cm/ 5NTU; very low flow; conductivity 117.2. (CitSci.org)
May, 2015	USACE: Sediment and Debris Removal for Goshen Dam/Lake Merriweather awarded on May 6 with project to be completed May 30; work postponed to September 21, 2015, so as not to interfere with camp season.
April, 2015	Canoers requested benthic monitoring and turbidity and sediment deposit measurements be performed on mouth of Little Calfpasture into the Maury. (DEQ - BF)

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April, 2015	BSA begins refilling lake. Little Calfpasture flow very slow and muddy; width diminishes from 53.5 feet across to 39 feet; water temp 63 degrees, air 76; turbidity 35cm/19NTU; conductivity 117.9 (CitSci.org)
April, 2015	After inquiry about status, RACC letter to EPA reported lost. Letter and packet resent. (Telephone call: sws)
March, 2015	Report to DEQ from recreational user of the Maury River for 15 years: "Over this past weekend I noticed that the Little Calfpasture seemed much murkier than usual as it joined the Calfpasture, especially given our recent rain history. I am quite familiar with what it normally looks like as the two flows combine. Especially compelling was how turbid entire Maury was a few miles downstream. Under normal circumstances the river is no longer crystal clear but we can still see the underwater rocks. On Saturday we could not."
March, 2015	Little Calfpasture: 53.5 ft wide; water temp 47.8 degrees, air 58; turbidity 33 cm/ 21NTU; conductivity 104.7 (CitSci.org)
February, 2015	USACE: RFP issued for sediment and debris removal at Goshen Dam/Lake Merriweather. Disposal of large debris to be coordinated with BSA. Sediment management instructions included. Post-verification by contractor shall consist of a bathymetric survey or physical soundings to verify that the specified minimum geometry has been achieved.
February, 2015	Little Calfpasture: 36 ft wide; water temp 37.9 degrees, air 52; turbidity 54 cm/9.8 NTU; conductivity 137.3 (CitSci.org)
January, 2015	USACE: removal of 500 total cubic yards of debris to restore the stream bed to its original conditions after the dam was built, in addition to the 200 cy to remove debris impacting gate operations.
January, 2015	RACC sends letter to EPA, Region 3, to request enforcement of EPA-approved 2010 TMDL for Little Calfpasture River.
January, 2015	Little Calfpasture: 33 ft wide; water temp 39 degrees, air 44; turbidity 63 cm/8 NTU; conductivity 156.7 (CitSci.org)
December, 2014	Little Calfpasture below dam listed impaired for e.coli and benthic -macroinvertebrate bioassessments.(DEQ integrated report 2014) [There are no Commonwealth TMDL standards for D/O or sediment, even though unsafe levels of these criteria are scientifically recognized. EPA website: water quality standards.]
December, 2014	DCR: BSA operating and maintenance manual for Goshen Dam not required. (Email DCR)
November, 2014	Trout Unlimited monthly ambient monitoring of Little Calfpasture begun at confluence with Calfpasture. Width 32 ft; water temp 42.6 degrees, air 63.3; turbidity 50 cm/11NTU; conductivity 200.5 (CitSci.org)
November, 2014	DCR: certificate approved entitling BSA to operate and maintain Goshen dam for six years pursuant to the Dam Safety Act (Section 10.1-604 et seq, Code of Virginia). (DCR file)
October, 2014	RACC's emailed questions to VaDEQ and EPA TMDL coordinators about operation & maintenance of Goshen dam: recommended USACE as the contact agency.
October, 2014	Request by letter from RACC to BSA to discuss water quality problems below Goshen Dam. (No response as of Jan 2015 – BF)
September, 2014	BSA informed of Termination of Special Consent Order (1993) and Amendment to Special Consent Order (1998)
September, 2014	Lake lowered for winter maintenance. (RC emergency management)
August, 2014	RACC representative meeting with DEQ representatives: discussion included sediment dumping not a permitting practice; BSA has never acknowledged the problem of dumping sediment into the Little Calfpasture and has never responded to the 2010 TMDL study of the river.

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August, 2014	DCR: DEQ reports that the 1998 Consent Order is no longer in effect. Ambient monitoring bi-monthly and benthic monitoring spring and fall is the only water quality protocol in place. BSA informs DEQ of their plans for maintaining the lake; no plan for sediment control included.
June, 2014	DCR to RACC via F&R: “ Outside of the scouting season, since the lake is not used there is no reason to leave the pool at the higher elevation and it makes perfect sense to reduce the pool level. Lowering the pool provides the dam with additional protection for storm storage particularly prior to charging the auxiliary spillway and also serves to lessen the depth and duration of flow in the auxiliary spillway should the storm be large enough to charge it anyway. The fall months immediately after the scouting season are the typical hurricane months and prior to the project the dam had already experienced a storm that very likely could have overtopped the dam if the pool had not been lowered so I completely agree with the BSA practices. The fact that the auxiliary spillway has been built is no reason to leave the pool elevated when not needed. Simply put, lowering the pool when not needed is good dam safety practice and it is the responsible action of the dam owner to do so.”
June, 2014	RACC to DCR: What is the safety function of routinely lowering the gates in the winter? It appears this is separate from a test to make sure that the gates are operating properly.
June, 2014	DCR: Operating plan and schedule for Goshen Dam: There are 10 mechanical gates that can adjust the pool elevation from a summer normal pool of 1369 and winter normal pool of 1359.5. During the summer season, the function of the gates is to maintain pool as close to 1369 as possible by partial or full opening to pass any storm water entering the gate.”
May, 2014	Corps reiterates that their only oversight of Lake Merriweather is protection of wetlands. The dam is not for flood control, recreation only. Engineering report for pre-construction visit unavailable. (USACE file)
May, 2014	BSA asks DEQ what new protocols are required. “We want to have a positive relationship with DEQ. We need to know that you have our back when our neighbors downstream become unreasonable with their requests and accusations that in most cases are unfounded and baseless as we have discussed in the past.”
April, 2014	USACE: Scope of work and cost estimate submitted for maintenance dredging of Goshen Dam/Lake Merriweather.
April, 2014	Presentation at Geological Society of America 63rd annual meeting: Identifying Seasonal Drawdown Events of Lake Merriweather: Implications for Water Quality in the Little Calfpasture and Maury Rivers (2000-2013): 14 of the 38 identified drawdowns of the lake appear to represent the times when water is being drained from the lake. While these high turbidity events are only temporary, there remain persisting observed changes in the quality of benthic habitat in the Little Calfpasture.
April, 2014	Invitation by email to BSA by RACC to discuss the problems of water quality below the dam. (No response)
February, 2014	USACE: dredging sediment planned for area behind Goshen Dam – plan area about 2,000 square feet with a total volume of about 140 cubic yards. Spoils to go upland on BSA property.
January, 2014	NCAC-BSA to USACE & F&R: RACC is part of a local group that does not need access to any pending documents between ACOE and BSA.
January, 2014	F&R: DEQ has no authority in the operation and maintenance of the dam; the Corps is not issuing any report, the spillway project is complete, and the O&M has been filed with DCR – the regulatory body that does have authority with regards to Goshen Dam.
November, 2013	USACE: the Final Condition Assessment and Rehabilitation Prioritization Report on Goshen Dam/Lake Merriweather submitted. Assessment: – 4 gates not-operable, 3 gates operate with difficulty, 3 gates operable

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- 50-year-old electrical and control systems in poor condition
- the 3 operable gates use a three-stage process which, with failure at any stage, render the gates inoperable
- significant amount of debris needs to be removed by dredging to ensure that gates can be lowered properly
- lower 10-inch diameter cold water discharge line plug valve is severely corroded and needs to be replaced.

Recommendations:

Short-term –

- new electrical and local controls for 3 best gates
- new automatic control system and telemetry to control the 3 best gates
- total cost: \$260,000

OR, secondary

- dredging
- refurbish three marginal gates, including replacement of bent stems new electrical and local controls for the 3 best gates & 3 refurbished gates new automatic control system and telemetry to control 3 best & 3 refurbished gates
- total cost: \$520,000

Long-term –

- replace gates and associated control system equipment
- total cost: \$1.9 million

OR, secondary

- rehabilitate existing gates
- total cost: \$820,000

November, 2013	NCAC-BSA total revenues - \$16,374,505; total expenses - \$12, 080,323; net assets - \$38,490,953. (CitizenAudit.org – BF)
November, 2013	The Nature Conservancy sells 0.43 non-tidal permanent wetland mitigation credits to NCAC-BSA. (Letter to Shirley Contracting – USACE file)
September, 2013	Lake lowered for winter “maintenance” (RC emergency management office)
September, 2013	RACC sends letter to F&R expressing concern that the EAP does not address the problems caused by lowering the lake during the non-camping months. (No response)
September, 2013	F&R records for completion of auxiliary spillway and upgrades to Goshen Dam. (Record Report for Impounding Structures and Application for O&M certificate – DCR file)
August, 2013	DEQ: the basic gate protocol for Goshen Dam is basically defunct/out of date with the upgrades to the dam and the gates. The expected revised protocol will replace the protocol referenced in the C.O. 1998 amendment.
Aug 4 2013	Residents downstream of dam report to DEQ a significant, bold rise in the Maury River in the middle of the day with lots of carp and a noticeable rise in water temperature. No notice of a draw down from Rockbridge Emergency.
July, 2013	After reviewing the EAP plan, RACC sends letter to F&R with 11 unsolicited suggestions for clarifying the procedures. (No response)
July, 2013	USACE: some digital and some hard copy of modeling of H&H dam break studies for Goshen Dam available free of charge at the request of a locality.
May, 2013	RACC phone call to USACE: There is not enough money to automate the gates. A team of engineers will visit Goshen Dam in the fall to evaluate what’s needed for operation, maintenance, and automation of the gates.
May, 2013	RACC phone call to F&R: Goshen Dam was not intended for flood control. Even so, it is designed to withstand a 100-year flood. Normally, water is allowed to flow in and out without any control. Water reaching 4 feet above normal pool would automatically be directed to the auxiliary spillway.

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May, 2013	USACE awards contract to Service Disabled Contracting Group for demolition and removal of existing log boom and to properly install a new debris boom and associated hardware which would not impede flow through the existing gated spillway. Cost: \$860,782.
May, 2013	RACC sends letter to F&R requesting an opportunity to make comments on the procedure plan for lowering the lake. (No response)
May, 2013	USACE: "The Corps will not be doing an inspection or providing procedures, since we were not tasked to perform the work."
May, 2013	DEQ requests BSA submit a revised plan/procedure for lowering lake levels.
May, 2013	USACE asks DCR for procedures for lowering the lake now that the spillway construction has been completed. DCR's reply: "As long as they do not exceed 6 to 12 inches per day we approve the procedure." DEQ ... "will not be offering guidance for this procedure."
April, 2013	F&R solicits contact information from downstream residents to include in the EAP.
April, 2013	F&R reports to DCR nearing completion: concrete cutback protection and the slope armor for the embankment installed and backfilled so the spillway channel is protected.
Jan 31 2013	BSA reports a jump in lake after 3.5 inches of rain from 16.5 feet to 25 feet. Three gates down. Reported to RC.
July, 1905	Rockbridge supervisor arranged a tour for RACC members and Rockbridge County administrators of the Goshen Reservation. RACC requested public notification of lake lowering. Camp Director and Dam Tender agree to do so through RC emergency coordinator for those subscribing to an online Dam list and will include a direct warning to MSA. Five bacterial samples are taken before camp opens each summer. No other water quality tests mentioned. The two BSA representatives verified that there is no plan to address a sediment problem. (RACC notes – current file)
December, 2012	2012 Integrated Report: Little Calfpasture below the dam remains impaired.
November, 2012	Memorandum of Agreement between USACE and NCAC-BSA: The Army will design and construct a debris boom and will evaluate, recommend design and repairs (if funding is available) for the existing spillway gates. In no event shall the total cost for the work exceed \$1,500,000 of federal funds. Upon exhaustion of repair funds the Army will have fulfilled any and all obligations pursuant to 507(3) of the WRDA of 1996.
October, 2012	BSA sends report of lake/dam monitoring to DEQ.
Aug 23 2012	DEQ reminds NCAC-BSA of the C.O. requirements and requests a modified plan for gate operations during the construction by September 30, 2012.
Aug 22 2012	BSA dismisses resident complaint: DEQ and Rockbridge officers were contacted by BSA and "it is our understanding that there were no issues and we were not asked to alter our process for lowering the lake. It is my understanding that this individual has a long history of complaints We will continue to be a good steward of our environment and good neighbor to our community."
August, 2012	DEQ requests that BSA submit a plan as to how the Scouts intend to operate the dam once the construction is completed.
Aug 10 2012	DEQ: Nothing was "received from the Scouts to indicate they were to begin construction of a spillway project." Also, the second quarterly report on lake levels, precipitation, etc. required by the C.O. was destroyed in a fire. This follows the lost first quarterly report.
Aug 8 2012	DEQ: investigation of water levels and increased turbidity reveals Calfpasture crystal clear and Little Calfpasture very turbid, about 2-3' visibility. The two waters remain distinct to about 1 river mile downstream of the confluence. The water being released from the lake appears greenish and moderately turbid which is likely due to planktonic algae from the lake.

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Aug 8 2012	According to SWCB, DEQ has no option for requiring a release plan under the NWP3.
Aug 7 2012	Report to DGIF/DEQ from downstream residents of visibly poor, smelly water with lots of carp. Residents request a better notification system about what is happening.
August, 2012	Lake lowered to 16 feet to prepare for construction of spillway by Shirley Contracting/Faulconer Construction. (Alteration Permit – DCR file)
August, 2012	USACE issues NWP3 permit to F&R for construction of spillway. The work will result in permanent and temporary impacts to Lake Merriweather and tributaries to Little Calfpasture.
July, 2012	F&S: submission of land disturbing permit package to Rockbridge County. Approved.
July, 2012	USACE: Memorandum to provide the project manager with a proposed scope of work for preparation of a simplified request for proposal for the Goshen Dam Debris Boom. Estimated cost: \$39,489.30.
July, 2012	F&S: submission of Lake Merriweather Dam Spillway Project Description to USACE.
May, 2012	F&S: “DEQ has saddled the Boy Scouts with a consent order to never again open the bottom drain sluice gate or suffer stiff financial penalty. This directly contradicts VA DCR Dam Safety regulation 4VAC50-20-280.”
May, 2012	W&L law school interns submit paper to RACC considering the laws addressing dam failure.
May, 2012	Neighbor upstream of Lake Merriweather expresses concern about the continual erosion and sloughing of banks into the creek on his property as a result of the water fluctuations of the lake.
April, 2012	USACE solicits bids for demolition and removal of existing log boom and installation of a new debris boom.
April, 2012	DCR issues a 2-year alteration permit for spillway construction by F&R.
April, 2012	F&R submits dam remediation project description to BSA with supporting documentation for SDF requested by DCR.
March, 2012	BSA reports loss of log book for the C.O. required quarterly report of lake level, precipitation, etc. for first quarter of 2012.
March, 2012	F&R: response to USACE’s request for revisions to the company’s wetland delineation and construction plans as discussed at the Mar 8, 2012 Jurisdiction Determination site meeting.
March, 2012	USACE: the Corps will no longer be responsible for any Goshen dam work – other than the boom and gate projects above. The Corps will also not be reviewing or approving F&R’s construction plans.
March, 2012	USACE: notice that HQ has federal funds for Goshen and has asked these be used to design and construct a log boom in front of the existing spillway gates and to modify the existing spillway gates so that they are automatic instead of manually operated. BSA would handle any permits needed for these projects.
March, 2012	DCR: requests F&R provide calculations for the SDF through the gates and the proposed auxiliary spillway and also to provide printed responses to the 147 comments made by the USACE on the Goshen Dam project.
March, 2012	DEQ: for spillway project a VWP permit not required provided the Goshen Dam remediation is authorized by USACE under a regional permit or Nationwide Permit for which DEQ has provided Water Quality Certification.
February, 2012	USACE issues a pre-construction notification to install debris boom and that item is removed from F&S design plan.
January, 2012	USACE: appropriate analysis needed for environmental impact of the work to be done at Goshen Dam.

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January, 2012	F&R reports potential 0.05 wetland impact from construction of auxiliary spillway for Goshen Dam
2012	Little Calfpasture below dam remains listed as impaired for D/O and sediment on state's list. (DEQ 2008 Integrated Report – DEQ file)
December, 2011	Two IDAs listed for Goshen Dam: 1) USACE (1999) safe spillway flow 86,500 cfs, and .2) Schnabel (2011) a safe flow of 89,000 cfs which DCR deems an appropriate SDF for this dam.
December, 2011	DCR accepts the general concept proposed for upgrading Goshen Dam with the understanding that the final general design will consist of: 1) a new open channel auxiliary spillway, 2) a concrete parapet wall the length of the top of the dam, 3) a new floating log boom.
October, 2011	At the request of DCR, Schnabel Engineering submits a third-party review of F&R's 35% design and recommends that the IDA be performed for proposed rehabilitation alternatives by applying the same ratios to sub-watershed when analyzing fractions of the PMP for the IDA. Should SDF be less than appropriate, a higher SDF can be recommended.
September, 2011	BSA: courtesy email to DEQ that they are lowering the lake for safety-related maintenance and plan to return to full pool by Nov 1. DEQ requests overdue quarterly reports of amount of flow over dam.
July, 2011	USACE submits 147 comments on F&R's 35% design.
July, 2011	F&R submits 35% design submittal to BSA for spillway construction.
May 5 2011	BSA: all actuators have been replaced but one, which will be in place within the day.
Apr 20 2011	DEQ: very muddy plume from Little Calfpasture reported.
January, 2011	Plans for modifications and repairs to the dam required by DCR are begun. BSA raises \$4 million to construct a spillway and hires Froehling & Robertson Inc. (F&R), a Roanoke engineering firm, to design a spillway that meets the criteria required to meet DCR safety requirements. (F&R email correspondence with DCR – DCR file)
October, 2010	VMRC authorizes USACE to install two 20-foot wide riprap toe protection structures, each extending 13 feet into the Little Calfpasture, immediately downstream of the Goshen Dam.
September, 2010	Analysis of MSA database for treating water releases from Lake Merriweather are significant, in thousands of dollars annually. (A. Mcthenia, hydrogeologist)
Sep 3 2010	Documents filed with IRS by NCAC-BSA: revenues of \$11 million in 2008. (www.claimsjournal.com)
September, 2010	\$5.7 million accumulated from WRDA 1996 appropriation for a concrete armor upgrade on Goshen Dam diverted to USACE-owned dams. BSA has no other plans to do the work – organization has no money for the project.
September, 2010	BSA: submits timeline for refurbishing actuators/motors to DEQ. Lake will need to be lowered during repairs from Oct 2, 2010 to Feb 10, 2011.
July, 2010	DEQ issues permit to USACE to permanently or temporarily impact up to two acres of nontidal wetlands or open water and up to 1,500 linear feet of nontidal stream bed to make repairs to Goshen Dam. VWP General Permit #WP4-10-0905.
June, 2010	DEQ verifies examination and repair of gates and actuators of Goshen Dam.
April, 2010	DCR certifies Dewberry & Davis' Emergency Preparedness plan for Low (stet) Hazard Virginia Regulated Impounding Structure for Goshen Dam.
April, 2010	EPA approves DEQ TMDL to Address a Benthic Impairment in the Little Calfpasture River, Rockbridge County, Virginia. (Letter and Decision Rationale – EPA file)

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February, 2010	Deva Borah, PhD, PE: review and evaluation of TMDL on Little Calfpasture found models, hydrologic parameters, flow data, sediment flux comparisons, and lake data inadequate for developing a TMDL.
January, 2010	DEQ presents TMDL to Address a Benthic Impairment in the Little Calfpasture River, Rockbridge County, Virginia: change of organisms, sediment and D/O problems caused by the yearly practice of lowering Lake Merriweather; possible models suggested for addressing the problems.
Jan 25 2010	Approximately 60 concerned citizens distributed and explained a written request to the Rockbridge County Board of Supervisors regarding condition of Goshen Dam and asked that safety procedures and the need to keep the public informed, among a number of other questions and concerns be addressed.
Jan 19 2010	Dewberry & Davis: Gate broken in pieces. Repair prolonged because parts unavailable.
Jan 4 2010	Gate #5 failure releases approximately 10 feet of lake level, sending a constant stream of sediment into the Little Calfpasture.
December, 2009	EPA: approves special standard – above – submitted by SWCB on 3/23/08. (2010 TMDL, p 74)
October, 2009	DCR: NCAC-BSA has a conditional permit specifying that work must be done to make the dam comply with the regulations mainly for spillway capacity issues. That certificate expires May 31, 2010. The Alteration Permit to address the spillway issues expired in 2008 when work did not start.
September, 2009	Maury Service Authority requests BSA to notify them when lowering the lake. (No response but BSA reports lowering to RC emergency coordinator in case there are questions)
Aug 4 2009	BSA withdraws its interest in Goshen Scout Reservation as the permanent site for the National Scout Jamboree.
August, 2009	DEQ monitoring shows no D/O violations but will continue to monitor to see if trend continues (2010 TMDL, p 77)
July, 2009	At DEQ's request to address the D/O problem, BSA's contractor, Bander Smith, installs an elbow and riser on the cold water release intake pipe so that the release comes from 3 feet higher in the lake's water column. (2010 TMDL, p 77)
May, 2009	SELC conclusion in evaluating Goshen reservation for the BSA Jamboree: "We think the BSA, given its environmental ethic, would agree that certain unique, scenic, remote and relatively unaltered natural areas are not appropriate for large-scale use and development and, indeed, that such use can ruin those very qualities that make the area ecologically important and enjoyable for visitors. We firmly believe that Goshen Pass is such an area."
April, 2009	Regional TMDL Director Robert Brent: Three stressors result from the presence of Goshen Dam and cause impairment of Little Calfpasture. 1) lake changes organisms that make up the base of the food chain; 2) decrease in dissolved oxygen; 3) sediment released from lake fills up spaces between rocks and gravel in a clean stream and smothers aquatic life. (DEQ public hearing, 11/09)
March, 2009	DEQ: General Water Quality Standards apply to discharges from the dam that contravene those standards which can be documented.
March, 2009	NCAC-BSA questions DEQ's authority to regulate and require the scouts to take specific actions to prevent the release of waters containing low dissolved oxygen and that being prevented from releasing the water makes it too difficult to control the lake levels. DEQ's calculations do not bear out problems in maintaining the lake level. DCR indicates that there is no dam safety issues with DEQ's suggestion regarding gate regulation.
July, 1905	Public meetings held by DEQ for comment on proposed TMDL: models included to address the problem of more sediment flowing into the lake than out. Unanswered question: Why is

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	BSA allowed control over lake since the river is navigable, surface water – Little Calfpasture is state-owned and available for public use? (Public hearings Apr - Nov, 2009)
July, 1905	Boy Scout Jamboree’s prospect of moving to the Goshen Scout Reservation meets with local opposition. Southern Environmental Law Center cites sediment problem among several other inadequacies. (Letter from SELC to BSA, May 15, 2009 – BF)
March, 2008	SWCB: In the Little Calfpasture) from 0.76 miles to 0.02 miles above its confluence with the Calfpasture River, aquatic life conditions are expected to gradually recover and meet the general aquatic life uses at 0.02 miles above its confluence with the Calfpasture River. (2010 TMDL, p 74) At 0.83 directly below dam to 0.76: dead zone. (p.74)
February, 2008	DEQ: report submitted on operational steps that might help to avoid low dissolved oxygen and/or discharges of solids.
September, 2007	DEQ monitoring, enforcement, and TMDL staff meet with BSA officials again to discuss the environmental problems associated with long-term lowering of the lake level. BSA again agrees to comply and DEQ assumes they have since then; however, local reports indicate otherwise. (See also, Paul Low’s study below – Apr 2014 – covering 2000-2013 stream flow analysis – BF)
August, 2007	DEQ conducts a depth measurement of the lake. The maximum recorded depth is 20 feet behind dam and an average of 6.68 feet. (2010 TMDL, 8/22/07, p 108)
August, 2007	Continued low dissolved oxygen measurements. DEQ visit on 8/22, finds foul- smelling and brownish-orange color of the water below the dam. Likely cause: opening of subsurface gate. (2010 TMDL, p 67)
June, 2007	Meeting at scout reservation to address Operation Procedures for Gated Spillway of Goshen Dam. Representatives attending: DCR-DS, DEQ, NCAC-BSA, RCEM, Dewberry & Davis, McGuire Woods. Issues unresolved.
June, 2007	NCAC-BSA: portion of the funds required to start construction lost in fiscal 2007 to Katrina and Troy hurricane recovery.
May, 2007	Regional TMDL coordinator Robert Brent submits a review of Amended Operation Procedures for Gated Spillway at Goshen Dam. Gate operation protocol for lowering lake even 4 feet in hurricane will impair downstream aquatic life. Without BSA deleted log information gate operation, decisions left to judgment of dam tender which negates purpose of operation protocol. (p 2, #s 4 and 8)
February, 2007	DEQ flow records: Largest recorded rainfall event since 1998 CO in the Calfpasture at Goshen was on 6/26/06, which is in the top 10 historic flows in the period of record since 1938 – 7.84 inches over a 4-day period. BSA reports no lowering of gates during this event – simply a full pool on 3/15/06 with no documentation of gate lowering until end of camp season on 9/5/06. There appears to be a different standard for “safe” during the camp season versus after the camp season.
February, 2007	DEQ Little Calfpasture stressor report: when not raining, turbidity consistently higher below the lake. Phytoplankton production within the lake also adds to the increased turbidity downstream; lowering of dam gates following storm events greatly increases downstream turbidity for 1 to 5 days (possibly up to 8 days). At more than 8 days conditions appear to clear and turbidity in lake outflow is only slightly higher than inflow.
January, 2007	DEQ reminds BSA that the CO does not allow extreme lowering of the lake for long period of time to conduct debris management.
January, 2007	DEQ biologist: Goshen dam is a recreational dam, not a flood control dam. It creates a shallow lake with a large watershed and acutally increases the risk of flooding to upstream neighbors. By lowering the lake, BSA exposes mudflats during offseason to keep the growth of aquatic weeds down. This mud washes over the dam in rain events.

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January, 2007	DEQ TMDL director: operational or design modification could mitigate impairment of Little Calfpasture in part, but nothing short of dam removal will probably completely eliminate the impairment. A TMDL will probably not do much good.
January, 2007	41 Vault privies installed throughout reservation. (Lex/RC DH - BF)
1999-2006	DEQ: conditions directly below the dam very poor, not likely to improve regardless of operation of dam. (2008 Integrated Report)
December, 2006	USACE, Norfolk District, announces plan to repair Goshen Dam, initiating construction in FY 2008.
December, 2006	Memorandum from director of Civil Works, Dept. of the Army: cost/benefit economic analysis and approval of USACE's plan to repair Goshen Dam for a cost not to exceed \$6 million, as directed in WRDA 1996, section 507(3).
September, 2006	*Lake lowered 184 days (seasonal debris)* (2010 TMDL, p 16)
August, 2006	DEQ: Continued low D/O violating water quality standards (2010 TMDL p 38)
August, 2006	Goshen Sout Camp requests permission from the Central Shenandoah Health district to install vault privies and drainfields after meeting regulations required (Lex/RC HD - BF)
August, 2006	USACE Dam Safety Evaluation Report submitted to DCR. Includes Hydrologic, Technical, and Environmental Evaluations. Recommends armoring the dam and operating only two spillway gates which "would eliminate the need to mechanically operate the spillway under emergency conditions [and would] eliminate the need for future lake drawdowns for dam safety purposes, thereby reducing the potential release of sediment." (USACE, DSE, Environmental p11) USACE's recommended plan also simpler for BSA to maintain since there would no longer be any raising or lowering or gates, especially in flood situations. (USACE, DCE, Environmental p. 12) Conclusion: There is an imperative water quality concern in the stream below Goshen Dam, as identified by VDEQ. Both the recreational opportunities and environmental issues need to be taken into account in addition to the dam safety issues at Goshen Dam." (USACE DSE, Hydrology, Appendix 4, p 23)
August, 2006	BSA expresses interest in updating latrines on the reservation. VDH outlines process for updating.
June, 2006	DEQ meets with BSA to reiterate the requirements of the Special Consent Order. BSA agrees to comply but then continues the practice of lowering the lake level for "maintenance". (2010 TMDL p. 15)
12/1997 to 2/2003	Records of dam operation obtained from BSA. As reported in 2010 TMDL, records were incomplete from 12/1997 to 2/2003. Records since 2/2003 have primarily only included a summary of gate operations and not lake levels. Large gaps in records during this time were also present.
December, 2005	*Lake lowered 91 days (seasonal debris)* (2010 TMDL, p 16)
Sep 2005	*Lake lowered 48 days (unknown)* (2010 TMDL, p 16)
August, 2005	DEQ: measurements show low dissolved oxygen (D/O), another stressor contributing to the benthic impairment of the Little Calfpasture below the dam. (8/1 - 8/5, 2010 TMDL, p 38)
October, 2004	*Lake lowered 160 days (seasonal debris)* (2010 TMDL, p 16)
September, 2004	*Lake lowered 37 days (Hurricanes Francis, Ivan, and Jeanne)* (2010 TMDL, p 16)
November, 2003	*Lake lowered 2 days. (Storm event)* (2010 TMDL, p16)
September, 2003	*Lake lowered 3 days. (Hurricane Isabel)* (2010 TMDL, p 16)
December, 2001	DGIF: Little Calfpasture River Turbidity Study plans monthly monitoring 11 sites for TSS,

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	turbidity, and stream flow from Jan 2002 through Dec 2002. (11/30/01 – DGIF file)
2001-03	Dec 2001 - Feb 2003: No quarterly records submitted by BSA. (2010 TMDL, p16)
October, 2000	BSA: reports to DEQ dam operation maintained in accordance with Consent Order, no lake lowering. (2010 TMDL, p 16)
June, 1905	DGIF's spot checks in March and July reveal elevated turbidity levels at the confluence of the Little Calfpasture with the Calfpasture (DGIF study 11/30/2001 – DGIF file)
1993-99	DGIF: Benthic sampling in spring and fall by DEQ found significant impairment due to sedimentation in Little Calfpasture between Goshen Dam and its confluence with the Calfpasture. (DGIF: Little Calfpasture Turbidity Study, 11/30/2001 – DGIF file)
September, 1999	Lake lowered for 28 days. (Hurricane Dennis)* (2010 TMDL, p 16)
August, 1999	DGIF: drought, no water over the dam, but water being discharged from lower valve is very poor in color with a lot of iron causing orange precipitate. (DGIF email to DEQ, 8/24/99 – BF)
May, 1999	USACE impact statement: If the Corps-proposed construction project is completed, the gates would no longer need to be drawn down in the fall and there would be a long term improvement of aquatic life in the Little Calfpasture. (USACE, Final Environmental Assessment, Goshen Dam, p 11 – USACE DSE)
April, 1999	O'Brien & Gere, Engineers, designed sewage disposal system for Camp Olmstead Dining Hall. Permitted by VDH. Included grease interceptor, septic tank, underground recirculating sand filter, pump station, dosing field. (BF)
April, 1999	DEQ response to USACE 1999 Environmental Assessment for Goshen Dam: The environmental degradation in the receiving waters below the dam "forms the basis for the proposed modification of Goshen Dam; accordingly, if the two spillway crest gates remaining intact after modification of the dam are to be operated for lake drawdown, even if only under emergency situations, DEQ requests that the emergency criteria which would support such operation be clearly defined." (Letter, Apr 6, 1999, from DEQ to USACE – DEQ file)
December, 1998	Because of increased level of dialogue from DEQ, NCAC-BSA requests a permit for O'Brien & Gere Engineers to update the septic system for the Camp Olmsted dining hall which has been a problem for several years. (Lex/RC HD - BF)
December, 1998	Staunton-Augusta Health Department submits a sewage disposal permit to address the wastewater disposal needs for the Goshen BS Reservation. Recommends Guest Camp Field appropriate for wastewater.(Lex/RC HD- BF)
October, 1998	DEQ: Little Calfpasture continues to be severely impaired below dam; the impairment is diminished further downstream, and it is evident into the Maury River. (Memorandum DEQ, 1/19/99 – BF)
April, 1998	SWCB: Amendment to the 1993 Consent Order with Appendix A requires BSA not to lower the lake except in an emergency and to submit self-monitored logs of daily gate practice quarterly to DEQ. (Agreement issued to BSA, signed April 6/April 17, 1998 – BF)
June, 1905	DGIF study: from Mar - May, turbidity below the dam measured 11 times showing statistically significant high levels. Conclusion: the degree of increased turbidity below the lake is directly tied to the operation of the dam. (2010 TMDL, p 62)
January, 1998	Lake lowered for 113 days. ("seasonal debris")* (2010 TMDL, p 16)
June, 1905	U.S. Congress appropriated \$6 million in the Water Resources Development Acts WRDA) for upgrades on Goshen Dam.
October, 1996	DEQ enforcement division: BSA might not appreciate the gravity of this situation given that its record with DEQ-Valley Regional Office suggests a perplexing resistance to cooperating with DEQ to resolve critical issues, notwithstanding DEQ-VRO efforts to address them with

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	alternative options. (Letter from DEQ enforcement to NCAC-BSA – BF)
October, 1996	DEQ followup to Notice of Violation: when sediment on the lake banks is exposed and erodes into the lake and eventually into the Little Calfpasture during rain/snow events, damage results to the river and its aquatic life. This environmental damage cannot be permitted to continue. (Letter from DEQ to BSA Oct 25, 1996 – BF)
September, 1996	SWCB: Notice of Violation for a general water quality standard requiring all state water be maintained at such quality as will support aquatic life. (NOV No. 9 VAC 25-260-20)
Jun 6 1996	DEQ: there is no improvement in the biological integrity of the Little Calfpasture downstream of the lake from 1993 through spring 1996. Chronic discharge of sediment with episodes of even heavier loading of fines during resuspension by storms is inhospitable to normal benthic assemblages. (Memorandum DEQ Jun 19, 1996 – background file)
May 22 1996	Complaint from Jay Gilliam regarding the turbidity in the Little Calfpasture and Maury rivers. (DEQ case history)
May 21 1996	Letter from Alan Lambert, BSA, to Roland Owens, DEQ-VRO, requesting the information DEQ used to determine BSA had violated the state water quality standard. (DEQ case history)
May 14 1996	Letter from Roland Owens, DEQ-VRO, to Alan Lambert, BSA, providing BSA the legal basis for the request to enter into an amended CO and possible future NOV's. (DEQ case history)
May 3 1996	Letter from Alan Lambert, BSA, to Roland Owens, DEQ-VRO, requesting the legal basis for wanting BSA to enter into an amended CO. (DEQ case history)
Apr 22 1996	Letter from Roland Owens, DEQ-VRO, to Alan Lambert, BSA, transmitting copies of the last three benthic surveys completed on the Little Calfpasture River, all showing a severe impact due to Lake Merriweather. (DEQ case history)
Apr 4 1996	Report from Michele Titman, DEQ-VRO: Little Calfpasture extremely turbid. (DEQ case history)
Feb 29 1996	Letter from Roland Owens, DEQ-VRO, to Alan Lambert, BSA, transmitting a draft amended CO. (DEQ case history)
Feb 5 1996	Letter from Duncan McGregor, DCR-Dam Safety, to Roland Owens, DEQ-VRO): No progress has been made on revising the O&M for the dam and greater concerns are raised due to the Jun 1995 flooding which pointed out the near impossibility of lowering the gates when faced with flooding which is not expected or predicted and gives greater importance to the need for additional spillway capacity or making radical changes to current operation procedures.(DEQ case history)
Jan 29 1996	Phone conversation between Roland Owens, DEQ-VRO, and Alan Lambert, BSA: discussed the situation and suggested an amended CO to address the problem. (DEQ case history)
Jan 13 1996	Letter from Alan Lambert, BSA, to Roland Owens, DEQ-VRO, in response to Dec 13, 1995 letter: several options were being pursued, including a \$10 million fundraising campaign (part of which would be earmarked to repair the dam), working with other government agencies, installing a new trash boom, making a decision on which option presented by Dewberry and Davis would be pursued, and stating that a detailed plan of action should be available by Jul 20, 1996. (DEQ case history)
Dec 13 1995	Letter from Roland Owens, DEQ-VRO, to Mike Hurlbert, BSA, requesting a status report and a plan and schedule to control the sedimentation from Lake Merriweather. (DEQ case history)
Nov 3 1995	Letter from Jay Gilliam to Elizabeth Scott, DEQ-VRO, regarding sedimentation problem at Lake Merriweather. (DEQ case history)
Aug 11 1995	Memo from Geoffrey Cowan, Dewberry and Davis, regarding the Jul 25, 1995, meeting (DEQ case history)

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Jul 25 1995	Meeting with BSA and their consultant to discuss different alternatives to address the problems with Lake Merriweather. Report presented. (DEQ case history)
May, 1995	DEQ: benthic monitoring of Little Calfpasture below dam suggests that no recovery will occur as long as the current practice of lowering the lake each winter is continued. (Memorandum DEQ May 19, 1995 – BF)
Oct 24 1994	Meeting with BSA to discuss possible DGIF involvement in the construction of an emergency spillway. (DEQ case history)
Aug 30 1994	Letter from Suzanne Bambacus, DEQ-OECA, to Jay Gilliam providing a status report and STORET data from the Little Calfpasture and Maury rivers. (DEQ case history)
Aug 16 1994	Letter from Jay Gilliam to Suzanne Bambacus, DEQ-OECA, asking for status of the case and monitoring completed by DEQ. (DEQ case history)
Aug 16 1994	Letter from Duncan McGregor, DCR-Dam Safety, to Donald Reinhardt, BSA, regarding the dam safety requirements for Lake Merriweather: 1) a regular O&M certificate approved for the dam on May 20, 1992; 2) the capacity of the spillway without overtopping the embankment is 50% of the probable maximum flood (PMF) which exists only when the gates are down or open and is referred to as the spillway design flood (SDF); 3) the required SDF is 50% of the PMF for the dam which is a reduction from what would normally be required based on a study and recommendation from J. K. Timmons and Associates; 4) being able to lower the gates is essential in assuring the safety of the dam; 5) under the current O&M plan, the lake level is immaterial as long as the gates can be operated; 6) the gates must be inspected, including the subsurface valve; 7) all potential sources of damage to the gates must be identified and controlled. (DEQ case history)
Aug 11 1994	Letter from Donald Reinhardt, BSA, to Suzanne Bambacus, DEQ-OECA, agreeing to an interim measure of not lowering the lake on a seasonal basis. BSA reserved the right to lower the gates in the case of storm events, ice buildup, or any other event which may damage the gates and affect the ability to operate the spillway. (DEQ case history)
Jul 14 1994	Letter from Donald Reinhardt, BSA, to Suzanne Bambacus, DEQ-OECA, indicating that Dewberry and Davis were working on the problem and a letter would be prepared within the next three weeks with recommendations to solve the problem. (DEQ case history)
Apr 21 1994	Complaint from Mr. Peyton Crom on turbid water in the Maury River. (DEQ case history)
Apr 19 1994	Memo to file from Mar 12 1994 meeting with BSA: Duncan McGregor, DCR-Dam Safety, stated that, while BSA's O&M manual for the dam required the lake to be lowered every fall, there was no reason the manual could not be amended and the lake maintained at full pool as long as there were procedures for emergency and routine inspection. The subjects of the coffer dam and emergency spillway were discussed and BSA stated they couldn't afford a coffer dam and Mr. McGregor believed an emergency spillway would be redundant and unnecessary. (DEQ case history)
Apr 18 1994	Site inspection by Ralph Bolgiano, DEQ-VRO: water in Little Calfpasture above the lake only slightly turbid, water discharging from the lake very turbid. (DEQ case history)
Apr 18 1994	Letter from Suzanne Bambacus, DEQ-OECA, to Jay Gilliam explaining that DEQ has been working with BSA since it was realized that the problem also exists whenever the lake is lowered during the winter. (DEQ case history)
Apr 13 1994	Letter from Donald Reinhardt, BSA, to Duncan McGregor, DCR- Dam Safety, requesting information about the dam. (DEQ case history)
Apr 13 1994	Complaint from C. T. McCormick regarding turbidity in the Little Calfpasture and Maury rivers. (DEQ case history)
April, 1994	DCR: lake lowering not required for dam safety, only emergency lowering following protocol of CO for gate repair needed. (Memorandum DEQ , office of compliance Apr 19,

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	1994 – BF)
April, 1994	Meeting of DEQ, DCR, and DGIF officials with BSA: siltation problem continues, caused by erosion of the exposed lake bottom when pool level lowered in winter. (Memorandum DEQ office of compliance Apr 19, 1994 – BF)
March, 1994	DEQ verifies that sedimentation problem has not been alleviated and benthic community remains severely impaired. (DEQ Mar 29, 1994 – BF)
Mar 29 1994	Letter from Suzanne Bambacus, DEQ-OECA, to Donald Reinhardt, BSA, rescheduling a meeting and explaining that the sedimentation problem was continuing and the benthic community below the dam was still severely impaired (DEQ case history)
Mar 29 1994	DEQ, DCR, DGIF, and Dam Safety officials meet to discuss terms of 1993 Consent Order. (DEQ Mar 29, 1994 – BF)
Mar 10 1994	Site visit by Ralph Bolgiano, DEQ: Little Calfpasture moderately turbid. (DEQ case history)
March, 1994	DEQ: sedimentation problem in Little Calfpasture has not been alleviated and benthic community remains severely impaired.
Feb 28 1994	Letter from Jay Gilliam to Suzanne Bambacus, DEQ-OECA, requesting that he be kept appraised of what was taking place between BSA and DEQ. (DEQ case history)
Jan 20 1994	Letter from Jay Gilliam to Ray Tesh, DEQ-VRO, requesting DEQ to take steps to solve the sedimentation problem caused by Lake Merriweather. (DEQ case history)
1993-97	DEQ: benthic monitoring spring & fall 100 meters downstream of dam shows Little Calfpasture severely impaired with little change during four years. (USACE DSE, p. 8, Environmental)
Dec 17 1993	Letter from Ray Tesh, DEQ-VRO, to Alexander Hopper, BSA, transmitting the latest benthic survey and requesting more information to satisfy Appendix A of the CO. (DEQ memo)
December, 1993	Complaint from Goshen Pass and Rockbridge Baths residents about turbidity in the Little Calfpasture and Maury rivers. (DEQ memo)
Dec 15 1993	Paul Bugas, DGIF: despite BSA operation of dam as required by CO, exposed mud flats of Lake Merriweather causing plume of silty water downstream as observed from swinging bridge. (Letter: DGIF to DEQ Dec 15 1993 – BF)
Nov 4 1993	Memo from Lance Gardner, DEQ, to Ray Tesh, DEQ-VRO, regarding 9/27 letter from BSA suggests a passive emergency spillway and a coffer dam structure to be used when repairs are needed. (DEQ memo)
Oct 13 1993	DEQ benthic survey: no recovery in Little Calfpasture, still severely impacted, problem continuing even without the use of the sub-surface valve. (DEQ memo 11/29- -- BF)
Sep 27 1993	Letter from Alexander Hopper, BSA, to Ray Tesh, DEQ-VRO, explaining BSA's future plans for the Lake Merriweather dam as required by the CO: 1) BSA will follow the procedures outlined in the CO when the lake was drained via the subsurface valve, 2) BSA would dredge the lake to remove the accumulated silt from the base of the dam by 1998 and construct an emergency spillway, and 3) a capital campaign would be run in the 1994-1998 time frame to pay for the capital improvements. (Letter from BSA to DEQ Sep 27, 1993, – BF)
Sep 3 1993	Letter from Robert Hume, Norfolk District Corps of Engineers, to Chuck Burgdorf, BSA, in regards to the discharge of sediment and asking BSA to consider ways to reduce the sedimentation problem. (DEQ memo)
May 14 1993	Letter from Alexander Hopper, BSA, to Suzanne Bambacus, DEQ-OECA, transmitting \$221.89 for fish kill and \$511.46 for investigative fees. (SWCB, Enforcement, Consent Order, Apr 30, 1993 – BF)

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May 5 1993	Letter from Suzanne Bambacus, DEQ-OECA, to alexander Hopper, BSA, stating the CO had been approved at the Apr 26, 1996 SWCB meeting and requesting that payment of the civil charge, investigative and fish replacement costs be made. (DEQ memo)
April, 1993	A Consent Order (CO) imposed by the SWCB requires BSA to implement an alternate method for draining the lake without opening the subsurface discharge or to construct a settling basin for removing sediment when using the subsurface discharge.(Special Consent Order, 1993 – BF)
Apr 28 1993	US FWS: possible impact by lowering lake on endangered James spinymusel.
Apr 19 1993	Letter from Alexander Hopper, BSA, to Suzanne Bambacus, DEQ-OECA, transmitting a letter from Chuck Burgdorf, BSA, to Ralph Bolgiano, DEQ, explaining why the required testing had not been conducted. Mr. Burgdorf requested that the sampling schedule be revised because it didn't make sense to him to be testing when flood waters were coming through the lake. (DEQ memo)
Apr 16 1993	Letter from John Roland, DEQ-OECA, to Alexander Hopper, BSA, regarding the lack of testing of the Lake Merriweather discharge. (DEQ memo)
Apr 15 1993	Letter from Ralph Bolgiano, DEQ-VRO, to Chuck Burgdorf, BSA, advising him that discharge waters must be monitored when the subsurface valve is used to comply with the CO. (DEQ memo)
Apr 15 1993	Memo from Ralph Bolgiano, DEQ-VRO, to Ray Tesh, DEQ-VRO, documenting an April 13, 1993 complaint of muddy water in the Maury River at Rockbridge Baths. The source was traced back to Lake Merriweather. Bolgiano attempted to inspect BSA's monitoring results, but no sampling had been completed since Mar 19, 1993, Sampling was completed on Apr 14, 1993, and the results were within the standards stated in the CO. (DEQ memo)
April, 1993	DEQ: Notice of Violation of Section 62.1-44.5 of code of Virginiaunpermitted discharge of sediment which resulted in an alteration of physical, chemical, or biological properties of State waters and produced a fish kill.(NOV No. 93-01-VRO-001)
Mar 8 1993	Letter from Chuck Burgdorf, BSA, to Lance Gardner, DEQ, stating the due to flooding, the daily water tests had been discontinued until the lake level was down to 9'6" (DEQ memo)
Mar 4 1993	Letter from Suzanne Bambacus, DEQ-DECA, to j. Alexander Hopper, BSA, with a revised CO to be signed and returned. (DEQ memo)
Mar 3 1993	Letter from Suzanne Bambacus, DEQ-OECA, to J. Alexander Hopper, BSA, with a CO to be signed and returned. The CSO only addressed the use of the subsurface valve to drain the lake. (DEQ memo)
Feb 19 1993	Letter from Richard Burton, DEQ, to J. Alexander Hopper, BSA, laying out minimum step which would need to be taken if the lake was drained again: VRO would provide the equipment and training necessary to gather and report the required information. (DEQ memo)
Feb 12 1993	Memo from Paul Bugas, DGIF, to Ralph Bolgiano, DEQ-VRO, regarding Little Calfpasture fish sampling and concluding that the sedimentation below the dam is so severe that the habitat for traditional upland stream fish species was "virtually nonexistent, and presence of imbedded sand and silt in Little Calfpasture below dam will undoubtedly have a negative impact on the future benthic community even in the absence of further releases from the lake. (Memorandum SWCB, Feb 23, 1993, Qualitative Benthic Survey, Little Calfpasture and Maury Rivers - DGIF file)
Feb 9 1993	Meeting between BSA and DEQ. No meeting summary in the file. (DEQ memo)
Feb 6 1993	Letter from J. Alexander Hopper, BSA, to Suzanne Bambacus, DEQ-OECA, disputing some of the conclusions which had been drawn by DEQ staff regarding the impact on Lexington's water supply and the need to lower the lake for repairs. (DEQ memo)
Feb 6 1993	Letter from J. Alexander Hopper, BSA, to DEQ with proposal regarding the draining of Lake

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	Merriweather to limit the sedimentation problem. (DEQ memo)
Feb 4 1993	Ralph Bolgiano, DEQ-VRO, conducted a benthic survey in the Little Calfpasture and Maury Rivers. Both stations on the L. Calf showed an impact. Significant impact on the Maury downstream of the confluence was not proven. (DEQ file)
Jan 26 1993	Meeting between DEQ and BSA at Goshen Scout Camp. Issues discussed included how DEQ releases information to the public and solutions for the sedimentation problem from the lake. (DEQ memo)
Jan 22 1993	Letter from J. Alexander Hopper, BSA to James Preston, DEQ-VRO, in response NOV. Letter stated that draining of the lake by the subsurface valve was to facilitate repairs and the discharge of the sediment was unintentional. BSA: "We want to do whatever is right and proper, not only to comply with the letter of the law but also to be good trustees of the land." (DEQ memo)
Jan 15 1993	Notice of Violation (NVO) VRO-01-VRO-001) issued for fish kill. (DEQ memo)
Jan 15 1993	USACE: notifies BSA of unauthorized discharge of lake sediment, a violation of Section 404 of CWA. Requires restoration of downstream impacts of sediment dumping. (Letter Jan 15, 1993 – BF)
January, 1993	BSA complains to DGIF about press coverage: DGIF response: measurable silt on substrate at Rockbridge Baths; increased water treatment by MSA needed to handle impact; notice of criminal violations of codes; alteration of operational handling of dam suggested. (Letter from DGIF to BSA, Jan 8, 1993 – BF)
Dec 17 1992	Fish kill below the dam reported. DGIF notified. 223 dead fish counted (Memoranda DGIF and DEQ – BF)
Dec 14 1992	DEQ and DGIF receive report of excessive sedimentation and find excess due to Lake Merriweather being drained via a subsurface discharge valve of the dam. (DEQ memo)
April, 1992	BSA: dam gates are damaged in April 1992 flood.
November, 1985	Election Day Flood. Goshen Pass closes for a year for VDOT to rebuild road. (News-Gazette)
June, 1905	USACE: Goshen Dam identified as a "High" hazard dam.(Phase I– Inspection Report National Dam Safety Program, Goshen Dam, Inventory No. 16301, dates March 15, 1979, by J.K. Timmons and Associates, and Schnabel Engineering Associates Inc, Richmond VA – USACE file - BF)
1976-80	Scout Reservation Camp PMI (Parking Management Inc.) closed by the Council due to ineffective drainage field. Reopens 1981. (BSA Camp PMI website - BF)
1967-92	DGIF: reported 9 unauthorized sediment discharges from Lake Merriweather (letter: US Fish & Wildlife Service to BSA Apr 28, 1993 – BF)
June, 1967	Goshen Reservation opens for camping (NCAC - BSA website - BF)
May, 1905	Construction of recreational dam completed for BSA by Herbert Associates.(BSA website - BF)
March, 1965	Report from Herbert Associates recommends that an earthen dam approximately 40 feet high, 1200 feet long, with a 138 foot long concrete overflow section topped with Bascule gate and impounding about 4700 acre feet of water on 438acres at a normal water surface elevation of 1369 feet above sea level. Cost: \$606,000 plus an additional \$68,000 for required roads and bridges. (USACE 2006 DSE; Technical, Appendix 7)
August, 1964	The Council contracts with Herbert Associates Inc of Harrisburg PA to provide a Feasibility Report for the proposed recreational dam and lake. (USACE 2006 DSE: Technical, Appendix 7)

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1960-66	The Council solicits sponsors from the Washington area to develop the property into a multiple camp Scout Reservation. Sponsors for 6 base camps are found, including money donated by Marjorie Merriweather Post to dam the Little Calfpasture and build a central administrative camp. (BSA Camp PMI website - BF)
May, 1905	As a non-profit organization, BSA will pay no real estate taxes to Rockbridge County. (RC Community Development)
May, 1905	NCAC-BSA purchases 5,000 acres bordering the DGIF's Goshen-Little North Mountain WMA and the Little Calfpasture River for \$300,000. (BSA Camp PMI website - BF)