

116 FERC ¶62,128  
UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

City of Holyoke Gas & Electric Department

Project No. 7758-004

ORDER ISSUING SUBSEQUENT LICENSE

(August 15, 2006)

**INTRODUCTION**

1. On February 25, 2005, pursuant to Part I of the Federal Power Act (FPA),<sup>1</sup> the City of Holyoke Gas & Electric Department (HG&E) filed an application for a subsequent license to continue to operate the existing 750-kilowatt (kW) Holyoke No. 4 Hydroelectric Project No. 7758. The project is located on the Holyoke Canal System, which is adjacent to the Connecticut River, in the City of Holyoke, Hampden County, Massachusetts.<sup>2</sup> The Holyoke No. 4 Project does not occupy federal land. As discussed below, I am issuing a subsequent license for the project.

**BACKGROUND**

2. The Commission issued the original license for the project on March 19, 1987, effective March 1, 1957,<sup>3</sup> for a 50-year period expiring on February 28, 2007.

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<sup>1</sup> 16 U.S.C. §§ 791a – 825r (2000).

<sup>2</sup> The project is located on the Holyoke Canal, which receives water from the Connecticut River, a navigable waterway of the United States. 2 FPC 380, 387 (1941).

<sup>3</sup> 38 FERC ¶ 62,270 (1987). This project was required to have been licensed on March 4, 1941, the date when the Connecticut River was determined to be a navigable waterway of the United States. Therefore, when the Commission licensed the project in 1987, it backdated the license to 1957, consistent with Commission practice at that time, thus allowing the maximum possible license term (50 years), but giving the licensee 20 years to operate under the license before it expired.

3. Notice of application was published in the Federal Register on June 8, 2005. No protests or motions to intervene were filed.
4. On September 27, 2005, the Commission issued public notice that the project was ready for environmental analysis and solicited comments, recommendations, terms and conditions, and prescriptions. In response, comments were filed by the U.S. Department of the Interior (Interior).
5. An environmental assessment (EA) was prepared by Commission staff and issued on May 18, 2006. No comments were filed on the EA. The comments and recommendations have been fully considered in determining whether, and under what conditions, to issue this license.

## PROJECT DESCRIPTION

6. The Holyoke No. 4 Project is located within the Holyoke Canal System, which contains 20 hydropower developments. Six of the developments, and the Holyoke Canal System itself, are licensed under the adjacent Holyoke Project No. 2004 (Hadley Falls Hydro Station).<sup>4</sup> The other developments, including the Holyoke No. 4 Project, are licensed separately. However, the operation of the Holyoke No. 4 Project is dependent on the operation of the Holyoke Project No. 2004, as discussed below.
7. The Holyoke No. 4 Project facilities are located between the first and second levels of the three-level Holyoke Canal System. The project draws water from the first level and releases it into the second level. The Holyoke No. 4 Project consists of: (1) two 7-foot-diameter, 76-foot-long penstocks drawing water from the first level canal of the Holyoke Canal System into; (2) a powerhouse with two 375-kW generating units with a total installed capacity of 750 kW leading to; (3) two 13-foot-wide, 300-foot-long tailraces discharging into the second level canal; (4) a 25-foot-long, 4.8-kilovolt (kV) transmission line; and (5) appurtenant facilities.<sup>5</sup> The proposed project boundary encloses all of the above facilities except the transmission line, but in this order I am requiring the inclusion of the transmission within the project boundary.

8. HG&E currently operates the Holyoke No. 4 Project only when sufficient flows are available in the first level of the canal. Flows into the Holyoke Canal System are regulated by HG&E through the operation of the Holyoke Project No. 2004 according to a

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<sup>4</sup> 88 FERC ¶ 61,186 (1999); and 111 FERC ¶ 61,106 (2005).

<sup>5</sup> One of the generating units was destroyed in an October 2004 fire and is currently not operating.

Comprehensive Flow Plan (Flow Plan) and Comprehensive Canal Operations Plan (Canal Operations Plan), which were approved by the Commission on June 24, 2003, and January 11, 2006, respectively.<sup>6</sup>

9. Within the first level of the canal, HG&E prioritizes flows first to the Holyoke No. 2 Project (FERC No. 2387), located at the far west end of the first level and beyond the Holyoke No. 4 Project, in order to provide flow through as much of the first level as possible. Flows are next provided to the Holyoke No. 1 Project (FERC No. 2386), located between Holyoke No. 2 and Holyoke No. 4. As such, the Holyoke No. 4 Project is operated primarily during higher flow periods when both Holyoke No. 1 and No. 2 are operating or when those projects are out-of-service. If Holyoke No. 1 and No. 2 are out-of-service, HG&E uses the Holyoke No. 4 Project to pass flows from the first level to the second level of the canal system.

10. HG&E proposes to rehabilitate the damaged generating unit to its former 375-kW capacity, and to continue to operate the project consistent with the Canal Operations and Canal Flow Plans under the Holyoke Project No. 2004 license.

## **WATER QUALITY CERTIFICATION**

11. Under section 401(a) (1) of the Clean Water Act (CWA),<sup>7</sup> the Commission may not issue a license for a hydroelectric project unless the state water quality certifying agency either has issued a water quality certification (certification) for the project or has waived certification by failing to act on a request for certification within a reasonable period of time, not to exceed one year. Section 401(d) of the CWA provides that the certification shall become a condition of any federal license or permit that is issued.<sup>8</sup>

12. On February 24, 2006, HG&E requested a waiver of certification from the Massachusetts Department of Environmental Protection (Massachusetts DEP). By letter filed on April 19, 2006, the Massachusetts DEP waived certification for the project, explaining that the certification issued for Project No. 2004 and the Settlement

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<sup>6</sup> 103 FERC ¶ 62,178 (2003), and 114 FERC ¶ 62,017 (2006). Pursuant to Article 406 of Project No. 2004 license (see 111 FERC ¶ 61,106), HG&E filed a revised Flow Plan in Project No. 2004 on September 6, 2005, which is currently pending before the Commission. Holyoke No. 4 will of course be operated consistent with any revised Flow Plan for Project No. 2004.

<sup>7</sup> 33 U.S.C. § 1341(a) (1) (2000).

<sup>8</sup> 33 U.S.C. § 1341(d) (2000).

Agreement for the relicensing of that project “specify all the conditions necessary to meet State water quality standards for the Holyoke No. 4 Project.”

### **COASTAL ZONE MANAGEMENT ACT**

13. Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA),<sup>9</sup> the Commission cannot issue a license for a project within or affecting a state’s coastal zone unless the state CZMA agency concurs with the license applicant’s certification of consistency with the state’s CZMA program, or the agency’s concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant’s certification.

14. By electronic mail dated March 30, 2006, the Massachusetts Office of Coastal Zone Management stated that the activities associated with the project fall outside the geographical boundaries of the Massachusetts Coastal Zone<sup>10</sup> and described in the Massachusetts Coastal Management Plan, and, therefore, are not subject to federal consistency review. Therefore, no consistency certification is required.

### **SECTION 18 FISHWAY PRESCRIPTIONS**

15. Section 18 of the FPA<sup>11</sup> provides that the Commission shall require the construction, maintenance, and operation by a licensee of such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate. By letter filed November 22, 2005, Interior requested that the Commission reserve its authority to require fishways. Consistent with Commission policy, Article 402 of this license reserves the Commission’s authority to require fishways that may be prescribed by Interior for the Holyoke No. 4 Project.

### **THREATENED AND ENDANGERED SPECIES**

16. Section 7(a)(2) of the Endangered Species Act of 1973 (ESA),<sup>12</sup> requires federal agencies to ensure their actions are not likely to jeopardize the continued existence of

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<sup>9</sup> 16 U.S.C. § 1456(3)(A) (2000).

<sup>10</sup> See Chapter 5: Massachusetts Coastal Regions and an Atlas of Resources, June 1, 1977.

<sup>11</sup> 16 U.S.C. § 811 (2000).

<sup>12</sup> 16 U.S.C. § 1536(a) (2000).

federally listed threatened and endangered species, or result in the destruction or adverse modification of their designated critical habitat.

17. The federally threatened bald eagle and Puritan tiger beetle, and the federally endangered dwarf wedgemussel and shortnose sturgeon are known to occur in the project area. However, the project does not provide habitat for the Puritan tiger beetle or the bald eagle; shortnose sturgeon are excluded from the Holyoke Canal System; and a recent survey of the Holyoke Canal System did not locate any dwarf wedgemussels.<sup>13</sup> Therefore, relicensing the Holyoke No. 4 Project would not affect these species.

### **NATIONAL HISTORIC PRESERVATION ACT ISSUES**

18. Under Section 106 of the National Historic Preservation Act (NHPA)<sup>14</sup> and its implementing regulations,<sup>15</sup> federal agencies are required to take into account the effect of any proposed undertaking on properties listed or eligible for listing in the National Register (defined as historic properties) and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking.

19. The Holyoke 4 project is within the Holyoke Canal Historic District, which is listed in the National Register of Historic Places, but the project structures have not been evaluated for their eligibility. By letter filed April 6, 2005, the Massachusetts State Historic Preservation Officer (SHPO) found that relicensing the Holyoke No. 4 Project would have no adverse effect on historic properties. The SHPO noted that if changes are proposed at Holyoke 4, the project is sufficiently connected to the Holyoke Project No. 2004 such that the procedures contained within the latter's Cultural Resources Management Plan<sup>16</sup> (CRMP) will provide the SHPO the opportunity for review and comment.

20. The Project No. 2004 CRMP requires HG&E to consult with the SHPO and follow the *Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* to apply the National Register Criteria to properties that have not been previously evaluated for National Register eligibility and may be affected by an

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<sup>13</sup> Rare Mussel Species Survey Report for Holyoke Project, FERC No. 2004, filed March 24, 2006.

<sup>14</sup> 16 U.S.C. § 470 *et seq.* (2000).

<sup>15</sup> 36 C.F.R. Part 800 (2005).

<sup>16</sup> The CRMP for the Holyoke Project No. 2004 was filed on September 8, 2000, and approved by the Commission on June 27, 2001.

undertaking, such as the generator replacement proposed by HG&E and required by Article 301. The EA notes, however, that the CRMP does not specifically include provisions for the Holyoke No. 4 Project facilities. Therefore, Article 403 of this license requires the licensee to use the procedures established in the CRMP to identify and protect historic resources and consult with the SHPO prior to conducting any alterations at the Holyoke No. 4 Project. This consultation satisfies the Commission's responsibilities under section 106 of the NHPA.

## **RECOMMENDATIONS OF FEDERAL AND STATE FISH AND WILDLIFE AGENCIES**

21. Section 10(j)(1) of the FPA<sup>17</sup> requires the Commission, when issuing a license, to include license conditions based on recommendations of federal and state fish and wildlife agencies submitted pursuant to the Fish and Wildlife Coordination Act,<sup>18</sup> to “adequately and equitably protect, mitigate damages to, and enhance fish and wildlife, (including related spawning grounds and their habitat)” affected by the project. No section 10(j) recommendations were filed for the Holyoke No. 4 Project.

## **OTHER ISSUES**

### Project Operation

22. As stated, HG&E currently operates the Holyoke No. 4 Project only when sufficient flows are available in the first level canal according to the Canal Operations Plan for Project No. 2004, which specifies how flows are to be distributed throughout the three levels of the canal.

23. HG&E proposes no changes to project operation and would continue to operate the project in accordance with the Project No. 2004 Canal Operations Plan. The EA recommended licensing the project as proposed by HG&E to ensure that aquatic resources in the canal are protected during the license term. Accordingly, Article 401 of this license requires project operation in accordance with the Canal Operations Plan, the pertinent portions of which are attached to this license as Appendix A.

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<sup>17</sup> 16 U.S.C. § 803(j)(1) (2000).

<sup>18</sup> 16 U.S.C. § 661 *et seq.* (2000).

### Generator Rehabilitation

24. In October 2004, a fire damaged one of the project's generating units and rendered it unusable. HG&E proposes, and the EA recommends, rehabilitating the damaged generating unit to make use of the hydro potential of the site. Accordingly, Article 301 of this license requires a plan to rehabilitate and operate the damaged unit.

## **ADMINISTRATIVE CONDITIONS**

### **A. Annual Charges**

25. The Commission collects annual charges from licensees for administration of the FPA. Article 201 provides for the collection of funds for administration of the FPA. Under the regulations currently in effect, projects such as this with an authorized installed capacity of less than or equal to 1,500 kW are not assessed an annual charge.

### **B. Exhibit F Drawings**

26. The Commission requires licensees to file sets of approved project drawings on microfilm and in electronic file format. Article 202 requires the filing of these drawings.

### **C. Exhibit G Drawings**

27. The exhibit G drawings filed on September 1, 2005, do not meet the current Commission requirements. The exhibit G drawings, sheets 1 and 2, do not include a stamp by a Registered Land Surveyor, and sheet 2 does not show the 25-foot-long transmission line within the project boundary and three known reference points. Article 203 requires HG&E to file revised exhibit G drawings. The exhibit G drawings filed on September 1, 2005, are therefore not approved and are not made part of the license (see ordering paragraph (C)).

### **D. Use and Occupancy of Project Lands and Waters**

28. Requiring a licensee to obtain prior Commission approval for every use or occupancy of project land would be unduly burdensome. Therefore, Article 404 allows the licensee to grant permission, without prior Commission approval, for the use and occupancy of project lands for such minor activities as landscape planting. Such uses must be consistent with the purposes of protecting and enhancing the scenic, recreational, and environmental values of the project.

## STATE AND FEDERAL COMPREHENSIVE PLANS

29. Section 10(a)(2)(A) of the FPA,<sup>19</sup> requires the Commission to consider the extent to which a hydroelectric project is consistent with federal and state comprehensive plans for improving, developing, or conserving waterways affected by the project.<sup>20</sup> Under section 10(a)(2)(A), staff identified and reviewed 9 federal and state comprehensive plans that are relevant to this project.<sup>21</sup> No conflicts were found.

## APPLICANT'S PLANS AND CAPABILITIES

30. In accordance with section 10 of the FPA,<sup>22</sup> and the Commission's regulations, staff have evaluated HG&E's record as a licensee with respect to the following: (A) need for power; and (B) safe management, operation, and maintenance of the project.<sup>23</sup> I accept the staff's findings in each of the following areas.

### A. Need for Power

31. The Holyoke No. 4 Project is located in the New England Power Pool region of the North American Electric Reliability Council (NERC). According to the NERC, demand for electric energy in the region is expected to increase at an average rate of 1.5 percent per year through 2014. Staff concludes that the project's power, low cost, displacement of nonrenewable fossil-fired generation, and contribution to the region's diversified generation mix will help meet the need for power in the region.

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<sup>19</sup> 16 U.S.C. § 803(a)(2)(A) (2000).

<sup>20</sup> Comprehensive plans for this purpose are defined at 18 CFR § 2.19 (2005).

<sup>21</sup> The list of applicable plans can be found in section IX of the EA for this project.

<sup>22</sup> 16 U.S.C. § 803 (2000).

<sup>23</sup> In order No. 513, the Commission exempted licensees of minor projects, such as HG&E, whose license waives sections 14 and 15 of the FPA, from the information requirements of 18 C.F.R. § 16.10 (2000). See *Hydroelectric Relicensing Regulations Under the Federal Power Act*, 54 *Fed. Reg.* 23756 (June 2, 1989) and 55 *Fed. Reg.* 10768 (March 23, 1990), FERC Statutes and Regulations, Regulations Preambles 1986-1990 ¶ 30,854 at 31,445 (May 17, 1989).



## B. Safe Management

32. Staff have reviewed HG&E's management, operation, and maintenance of the Holyoke No. 4 Project and the project's operation reports and concludes that there is no reason to believe that HG&E cannot continue to safely manage, operate, and maintain these facilities under a subsequent license.

## PROJECT ECONOMICS

33. In determining whether a proposed project will be best adapted to a comprehensive plan for developing a waterway for beneficial public purposes, the Commission considers a number of public interest factors, including the economic benefit of the project power. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corp.*,<sup>24</sup> the Commission employs an analysis that uses current costs to compare the costs of the project and likely alternative power, with no forecasts concerning potential future inflation, escalation, or deflation beyond the license issuance date. The basic purpose of the Commission's economic analysis is to provide a general estimate of the potential power benefits and the costs of a project, and of reasonable alternatives to project power. The estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license.

34. In applying this analysis to the Holyoke No. 4 Project, staff have considered two options: a no action alternative and HG&E's proposal, as licensed herein. Under the no action alternative, without rehabilitating the damaged generator, the estimated average annual generation of the Holyoke No. 4 Project is 1,574 MWh, providing an annual power value of about \$84,000, or \$53.35/MWh.<sup>25</sup> The annual cost would be \$56,000, or \$35.56/MWh. To determine whether the proposed project is currently economically beneficial, staff subtracts the project's cost from the value of the power the project produces. Therefore, in the first year of operation, the project would cost \$28,000, or \$17.79/MWh less than the likely alternative cost of power.

35. As proposed by HG&E and licensed herein, including rehabilitating the damaged generator, the annual cost of the project would be about \$135,300, or \$42.97/MWh. The annual power value for the estimated annual generation of 3,148 MWh, would be

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<sup>24</sup> 72 FERC ¶ 61,027 (1995).

<sup>25</sup> Our estimate of the cost of alternative power is based on the Energy Information Administration's (EIA) Annual Energy Outlook for 2005 and its supplemental data on the EIA Internet Homepage.

\$167,900, or \$53.35/MWh. Therefore, in the first year of operation, the project would cost \$32,700, or \$10.38/MWh less than the likely alternative cost of power.

36. In considering public interest factors, the Commission takes into account that hydroelectric projects offer unique operational benefits to the electric utility system (ancillary service benefits). These benefits include their capacity to provide almost instantaneous load-following response to dampen voltage and frequency instability on the transmission system, system-power-factor-correction through condensing operations, and a source of power available to help in quickly putting fossil-fuel-based generating stations back on line following a major utility system or regional blackout.

### **COMPREHENSIVE DEVELOPMENT**

37. Sections 4(e) and 10(a) of the FPA<sup>26</sup> require the Commission to give equal consideration to the power development purpose and to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of fish and wildlife, the protection of recreational opportunities, and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. The decision to license this project, and the terms and conditions included herein, reflect such consideration.

38. The EA for the project contains background information, analysis of effects, and support for related license articles. I conclude based on the record of this proceeding, including the EA and the comments thereon, that licensing the Holyoke No. 4 Project as described in this order would not constitute a major federal action significantly affecting the quality of the human environment. The project will be safe if operated and maintained in accordance with the requirements of this license.

39. Based on our independent review and evaluation of the project, recommendations from the resource agencies and other stakeholders, and the no-action alternative, as documented in the EA, I have selected the Holyoke No. 4 Project as proposed by HG&E, and find that it is best adapted to a comprehensive plan for improving or developing the Connecticut River.

40. I selected this alternative because: (1) issuance of a subsequent license will serve to maintain a beneficial, dependable, and an inexpensive source of electric energy; (2) the required environmental measures will protect aquatic resources and historic properties; and (3) the 750 kilowatts of electric energy generated from this renewable resource will

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<sup>26</sup> 16 U.S.C. §§ 797(e) and 803(a)(1).

continue to offset the use of fossil-fueled, steam-electric generating plants, thereby conserving nonrenewable resources and reducing atmospheric pollution.

### **LICENSE TERM**

41. The Commission's general policy is to establish 30-year terms for projects with little or no redevelopment, new construction, new capacity, or environmental mitigation and enhancement measures; 40-year terms for projects with a moderate amount of such measures; and 50-year terms for projects with extensive measures. In this case, as explained in this order, given the relationship of this project to the Holyoke Project No. 2004, the term of this license will be such that it will expire at the same time as the Project No. 2004 license.<sup>27</sup> Therefore, the term of this license will be 32 years and 6 months, and will expire August 31, 2039, the expiration date of the Project No. 2004 license.

#### *The Director orders:*

(A) This license is issued to the City of Holyoke Gas & Electric Department (licensee) for a period of 32 years and 6 months, effective March 1, 2007, to operate and maintain the Holyoke No. 4 Project. This license is subject to the terms and conditions of the FPA, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the FPA.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interest in those lands, enclosed by the project boundary shown by the revised exhibit G drawings filed September 1, 2005.

(2) Project works consisting of: (1) two 7-foot-diameter, 76-foot-long penstocks drawing water from the first level canal of the Holyoke Canal System; (2) a powerhouse with two 375-kW generating units with a total installed capacity of 750 kW (one of the generating units was destroyed in an October 2004 fire and is currently not operating); (3) two 13-foot-wide, 300-foot-long tailraces discharging into the second level canal; (4) a 25-foot-long, 4.8-kV transmission line; and (5) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of exhibits A and F shown below:

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<sup>27</sup> In issuing new and subsequent licenses, the Commission will coordinate the expiration dates of licenses to the maximum extent possible, to maximize future consideration of cumulative impacts at the same time in contemporaneous proceedings at relicensing. See 18 C.F.R. § 2.23 (2004).

Exhibit A: Pages A-5 and A-14 filed on February 25, 2005.

Exhibit F: The following exhibit F drawings filed on September 1, 2005.

<u>Exhibit F Drawings</u>	<u>FERC No. 7758-</u>	<u>Showing</u>
Sheet 1	1001	Plan and Section
Sheet 2	1002	Intake Details

(3) All of the structures, fixtures, equipment, or facilities used to operate or maintain the project and located within the project boundary, all portable property that may be employed in connection with the project, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) The exhibits A and F described above are approved and made part of this license. The exhibit G drawings filed as part of the application for license do not conform to Commission regulations and are not approved.

(D) The following sections of the FPA are waived and excluded from the license for this minor project:

4(b), except the second sentence; 4(e), insofar as it relates to approval of plans by the Chief of Engineers and the Secretary of the Army; 6, insofar as it relates to public notice and to the acceptance and expression in the license of terms and conditions of the Act that are waived here; 10(c), insofar as it relates to depreciation reserves; 10(d); 10(f); 14, except insofar as the power of condemnation is reserved; 15; 16; 19; 20; and 22.

(E) This license is subject to the articles set forth in Form L-9 (Revised October 1975), entitled "Terms and Conditions of License for Constructed Minor Project Affecting Navigable Waters of the United States," (*see* 54 FPC 1799 *et seq.*), and the following additional articles:

Article 201. Administrative Annual Charges. The licensee shall pay the United States annual charges, effective March 1, 2007, as determined in accordance with provisions of the Commission's regulations in effect from time to time, for the purposes of reimbursing the United States for the cost of administration of Part I of the Federal Power Act. The authorized installed capacity for that purpose is 750 kilowatts. Under the regulations currently in effect, projects with authorized installed capacity of less than or equal to 1,500 kilowatts will not be assessed annual charges.

Article 202. Exhibit F Drawings. Within 45 days of the effective date of this license, the licensee shall file the approved exhibit F drawings in aperture card and electronic file formats.

a) Three sets of the approved exhibit drawings shall be reproduced on silver or gelatin 35mm microfilm. All microfilm shall be mounted on type D (3-1/4" X 7-3/8") aperture cards. Prior to microfilming, the FERC Drawing Number (*e.g.*, P-1234-1001 through P-1234-####) shall be shown in the margin below the title block of the approved drawing. After mounting, the FERC Drawing Number shall be typed on the upper right corner of each aperture card. Additionally, the Project Number, FERC Exhibit (*e.g.*, F-1, etc.), Drawing Title, and date of this license shall be typed on the upper left corner of each aperture card.

Two of the sets of aperture cards shall be filed with the Secretary of the Commission, ATTN: OEP/DHAC. The third set shall be filed with the Commission's Division of Dam Safety and Inspections-New York Regional Office.

b) The licensee shall file two separate sets of exhibit drawings in electronic raster format with the Secretary of the Commission, ATTN: OEP/DHAC. A third set shall be filed with the Commission's Division of Dam Safety and Inspections-New York Regional Office. Exhibit F drawings must be identified as (CEII) material under 18 CFR §388.113(c). Each drawing must be a separate electronic file, and the file name shall include: FERC Project-Drawing Number, FERC Exhibit, Drawing Title, date of this license, and file extension in the following format [P-1234-####, F-1, Project Description, MM-DD-YYYY.TIF]. Electronic drawings shall meet the following format specification:

IMAGERY - black & white raster file  
 FILE TYPE – Tagged Image File Format, (TIFF) CCITT Group 4  
 RESOLUTION – 300 dpi desired, (200 dpi min)  
 DRAWING SIZE FORMAT – 24" X 36" (min), 28" X 40" (max)  
 FILE SIZE – less than 1 MB desired

Article 203. Exhibit G Drawings. Within 45 days of the effective date of this license, the licensee shall file, for Commission approval, revised exhibit G drawings enclosing all licensed project works, including the 25-foot-long, 4.8-kV transmission line necessary for operation and maintenance of the project. The revised exhibit G drawings must comply with sections 4.39 and 4.41 of the Commission's regulations.

Article 301. Rehabilitation of Damaged Generating Unit. Within 3 months of the effective date of this license, the licensee shall file for Commission approval a plan, with schedule, to rehabilitate and operate the damaged generating unit. The licensee shall

submit one copy to the Division of Dam Safety and Inspections-New York Regional Engineer and two copies to the Commission (one of these shall be a courtesy copy to the Director, Division Dam Safety and Inspections).

The Commission reserves the right to require changes to the plan. The plan shall not be implemented until the licensee is notified that the plan is approved. Upon approval, the licensee shall implement the plan according to the approved schedule, including any changes required by the Commission.

Article 401. Project Operation. The project shall operate in accordance with sections 2.0 and 3.0 (Appendix A of this license) of the Comprehensive Canal Operations Plan filed for the Holyoke No. 2004 Project on June 20, 2005, supplemented on October 11, 2005, and approved on January 11, 2006 (114 FERC ¶ 62,017), as that Plan may be modified from time to time.

Project operation may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon mutual agreement between the licensee and the Massachusetts Department of Fish and Wildlife and the U.S. Department of the Interior. If project operation is so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident.

Article 402. Reservation of Authority to Prescribe Fishways. Authority is reserved by the Commission to require the licensee to construct, operate, and maintain, or to provide for construction, operation, and maintenance of, such fishways as may be prescribed by the Secretary of the U.S. Department of the Interior under section 18 of the Federal Power Act.

Article 403. Cultural Resources Management Plan. Prior to rehabilitating the damaged generating unit at Holyoke No. 4 Project, the licensee shall follow the procedures provided in the Action Plan (section IV) of the Cultural Resources Management Plan (CRMP) for the Holyoke No. 2004 Project, filed September 8, 2000, as modified and approved by the Commission on June 27, 2001 (95 FERC ¶ 62,274).

If rehabilitation of the project is found to affect historic properties, the licensee shall prepare a plan and include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the Massachusetts State Historic Preservation Officer (SHPO), and specific descriptions of how the SHPO's comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the SHPO to comment and to make recommendations before filing the plan with the Commission for approval. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on

site-specific information. The licensee shall not commence rehabilitation of the damaged unit notified by the Commission that the plan is approved.

Article 404. Use and Occupancy. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters, and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy are consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancy, for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are (much of this needs to be removed): (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancements. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction; (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site; and (3) determine that the proposed construction is needed and would not change the basic contour of the impoundment shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The

Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project impoundment. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of, project lands for: (1) construction of new bridges or roads for which all necessary state and approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved exhibit R or approved report on recreational resources of an exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is 5 acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Energy Projects, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked exhibit G map may be used), the nature of the proposed use, the identity of any Federal or state agency official consulted, and any Federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.



(e) The following additional conditions apply to any intended conveyance under paragraphs (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with Federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved exhibit R or approved report on recreational resources of an exhibit E; or, if the project does not have an approved exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands shall occur in a manner that shall protect the scenic, recreational, and environmental values of the project; and (iii) the grantee shall not unduly restrict public access to project waters.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised exhibit G drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article shall be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised exhibit G drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to the filing. Proof of service on these entities must accompany the filing with the Commission

(G) This order is final unless a request for rehearing is filed within 30 days from the date of its issuance, as provided in section 313(a) of the FPA. The filing of a request for rehearing does not operate as a stay of the effective date of this license or of any other date specified in this order, except as specifically ordered by the Commission. The licensee's failure to file a request for rehearing shall constitute acceptance of this license.

J. Mark Robinson  
Director  
Office of Energy Projects

**Form L-9**  
(October, 1975)

**FEDERAL ENERGY REGULATORY COMMISSION**

**TERMS AND CONDITIONS OF LICENSE FOR CONSTRUCTED  
MINOR PROJECT AFFECTING NAVIGABLE  
WATERS OF THE UNITED STATES**

**Article 1.** The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

**Article 2.** No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

**Article 3.** The project area and project works shall be in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

**Article 4.** The project, including its operation and maintenance and any work incidental to additions or alterations authorized by the Commission, whether or not conducted upon lands of the United States, shall be subject to the inspection and

supervision of the Regional Engineer, Federal Energy Regulatory Commission, in the region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him such information as he may require concerning the operation and maintenance of the project, and any such alterations thereto, and shall notify him of the date upon which work with respect to any alteration will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall submit to said representative a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of any such alterations to the project. Construction of said alterations or any feature thereof shall not be initiated until the program of inspection for the alterations or any feature thereof has been approved by said representative. The Licensee shall allow said representative and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

**Article 5.** The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights or occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

**Article 6.** The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage,

and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative. The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may be mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

**Article 7.** The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

**Article 8.** The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

**Article 9.** The United States specifically retains and safeguards the right to use water in such amount, to be determined by the Secretary of the Army, as may be necessary for the purposes of navigation on the navigable waterway affected; and the operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Secretary of the Army may prescribe in the interest of navigation, and as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Secretary of the Army may prescribe in the interest of navigation, or as the Commission may prescribe for the other purposes hereinbefore mentioned.

**Article 10.** On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

**Article 11.** The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

**Article 12.** Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

**Article 13.** So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and

adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

**Article 14.** In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon the request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

**Article 15.** The Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

**Article 16.** Material may be dredged or excavated from, or placed as fill in, project lands and/or waters only in the prosecution of work specifically authorized under the license; in the maintenance of the project; or after obtaining Commission approval, as appropriate. Any such material shall be removed and/or deposited in such manner as to reasonably preserve the environmental values of the project and so as not to interfere with traffic on land or water. Dredging and filling in a navigable water of the United States shall also be done to the satisfaction of the District Engineer, Department of the Army, in charge of the locality.

**Article 17.** If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the

Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

**Article 18.** The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

**Article 19.** The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.



## Appendix A

### The City of Holyoke Gas & Electric Department Comprehensive Canal Operations Plan Sections 2.0 and 3.0 Filed June 20, 2005

#### 2.0 HOLYOKE CANAL SYSTEM

The Holyoke canal system consists of three levels, referred to as First, Second, and Third Level Canals (see Figure 1-1). The typical water surface elevation of each of the canals is 97.47 ft, 77.47 ft and 64.97 ft, respectively (NGVD). Each level of the canal system provides water for industrial use and hydropower generation. During mean flow conditions, the canal system is operated at various total discharges up to its 6,600 cfs hydraulic design capacity, with a total generation flow of approximately 6,000 cfs. Some distribution of flows between the various canal levels and project and non-project hydro stations on the canal is determined by long standing water use agreements. At all times the flow entering the canal system must be balanced with total canal flow returned to the river to maintain safe operating levels in the canal. Canal inflow is directed back to the river or to the next canal level through various generating stations, water conduits, overflow structures, and leakage.

There are a total of 20 hydroelectric generating stations currently in service on the Holyoke canal system (Table 2-1). The Hadley Falls station is located on the impoundment. The canal system begins with the canal gatehouse structure located between the Hadley Falls station and the western shore. The gatehouse discharges water into the First Level Canal, a subsystem about 6,500 ft long, running through the City of Holyoke. The No. 1 Overflow structure, which is located immediately downstream of the gatehouse, discharges water directly back into the river.

The First Level Canal discharges water into the Second Level Canal through nine generating stations located along its length; seven of these stations are operational.<sup>28</sup> The HG&E licensed projects (all operational) on the First Level Canal are: Boatlock, Beebe-Holbrook, and Skinner (all covered in FERC No. 2004); Holyoke 1 (FERC No. 2386); Holyoke 2 (FERC No. 2387); and Holyoke 4 (FERC No. 7758). The First Level Canal also includes two unlicensed projects - Aubin (also known as Anitec) and the out-of-service Parsons station - and the location of the former unlicensed Xidex station; none of these is owned or operated by HG&E. There is a downstream fish passage louver facility, which begins 554 ft downstream of the canal gatehouse. The louver is angled across the

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<sup>28</sup> There is also a facility owned by Hart Top Manufacturing, which is used as process water and is not a generating facility.

canal and is 440 ft long. It ends at a bypass facility and pipe which transports migrating fish to the Hadley Station tailrace.

The Second Level Canal includes eleven in-service generating stations, the No. 2 Overflow structure that discharges into the Hadley Falls Station tailrace, the No. 3 Overflow, and a pipe that discharge to the Third Level Canal. The following stations on the Second Level Canal are located between the Second Level Canal and the Connecticut River about 3,500 ft north of the Boston & Maine Railroad bridge: Riverside (FERC No. 2004), Station No. 5 (FERC No. 10806), Crocker Mill A and B (FERC No. 2758), Crocker Mill C (FERC No. 2770), Albion Mill D (FERC No. 2766), Albion Mill A (FERC No. 2768), Mt. Tom Mill (FERC No. 2497), Nonotuck (FERC No. 2771), Gillmill A (FERC No. 2772), and Gillmill D (FERC No. 2775).<sup>29</sup> The Holyoke 3 station (FERC No. 2388) is located between the Second and Third Level Canals.

The Third Level Canal is supplied with water from the Holyoke 3 station and the No. 3 Overflow. It is about 4,000 ft in length, and is located largely at the low-lying southern end of the canal system in the City of Holyoke, mostly parallel to the bank of the Connecticut River. The Third Level Canal includes the No. 4 Overflow structure located between the canal and the Connecticut River. The Chemical (FERC No. 2004) and Sonoco (unlicensed) stations are located between the Third Level Canal and the Connecticut River about 3,400 ft south of the railroad bridge.<sup>30</sup>

The Holyoke Canal District was listed in the National Register in 1980 and is eligible for listing as an historic district.

### 3.0 CANAL OPERATIONS PLAN

The Canal Operations Plan details HG&E's proposed methods to: (1) release and circulate the required 400 cfs continuous minimum flow through the canal system downstream of the louver bypass; and (2) achieve and maintain the minimum canal flow and protective requirements for aquatic resources, including mussels during canal maintenance drawdowns.

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<sup>29</sup> All of these stations are owned by HG&E. As noted above, the Crocker Mill A and B, Crocker Mill C, Albion Mill D, Albion Mill A, Mt. Tom Mill, Nonotuck, Gillmill A, and Gillmill D stations were acquired by HG&E from Harris Energy and Realty Coorporation, and are jointly referred to as "the Harris Projects." Further, as noted above, Station No. 5 has been recently re-acquired by HG&E.

<sup>30</sup> Only the Chemical station is owned by HG&E.

### 3.1 Canal Operations and Flow Releases

Minimum project flows for the Holyoke Project, including flows into the canal system, are detailed in LA 406 from the Settlement Agreement and WQC Condition 12. HG&E's plan to provide minimum flows for the entire Holyoke Project is detailed in the COFP, which was developed in conjunction with this CCOP. Both LA 406 and the WQC call for a year-round continuous minimum flows of 400 cfs downstream of the louver bypass. As reflected in LA 406(e), this minimum canal flow is assigned the highest priority of any minimum flow, including flows into the bypass reach.

The Holyoke Project Canal system is typically operated by continuously maintaining the First Level Canal at Elevation 97.47 ft (NGVD) except during drawdowns, inspections, and emergencies. The number of open headgates, positions of each headgate, and headpond elevations, are used to regulate the amount of water entering the canal to maintain the canal system at a constant level. The position of the 12 headgates and headpond elevations are continuously monitored by the gatehouse operator, adjusted as necessary to maintain a constant canal elevation.

Water from the First Level Canal is discharged into the Second Level Canal or attraction water gates and louver bypass gates utilized to operate upstream and downstream fish passage facilities. Water in the Second Level Canal is discharged to either the Third Level Canal or directly to the river through turbines or canal drain gates.

Estimates of water flow through the canal turbines have been derived using turbine manufacturer data and/or correlating generation to hydraulic flows for the turbines on the canal system. All canal generation is monitored by the gatehouse operator and recorded hourly in a log. Drain and feed gate positions on the canal system are, and will continue to be, monitored and recorded hourly by the gatehouse operator along with the volume of water flow that passes through the gatehouse gates.

HG&E developed a series of matrices detailing project operations (including dispatch of the canal units) over a range of flows for habitat flows, and the Spring and Fall Bypass Zone of Passage (ZOP) flows for upstream and downstream fish passage seasons, pursuant to LA 406(a) under the Settlement. These matrices are included below as Figures 3-1, 3-2, and 3-3. In developing the project operations matrices, HG&E's goal was to dispatch the canal units in a manner that would maximize the amount and distribution of water throughout the canal system. Specific details on canal station dispatch are described below.

### 3.1.1 Spring Passage

During spring fish passage season (generally April 1- July 15), while water is first dispatched to the canal system, the amount that is allocated depends on the river flow (Figure 3-1). When river flows are below 5,400 cfs, 400 cfs will be circulated in the First Level Canal below the louver bypass and will normally be discharged through HG&E's Holyoke 2 station into the Second Level Canal. From there, the water will pass through the Holyoke 3 or No. 3 Overflow and Riverside Stations. Flow will split approximately evenly between the two stations, which in turn will maximize flow distribution throughout the Second Level Canal. Water discharged from Holyoke 3 will enter the Third Level Canal, while water discharged from Riverside Station will flow back into the Connecticut River. In the Third Level Canal, water will be discharged through the Chemical station, Sonoco station, and/or the No. 4 Overflow back into the river.

When river flows reach approximately 5,400 cfs, water in the canal system will increase from 400 cfs to 2,400 cfs. Station dispatch is as noted above, but on the First Level Canal, Parsons (or other units under HG&E control), Aubin and Boatlock stations are also brought online, if the stations are operational. On the Second Level Canal, Station No. 5 and all eight Harris Projects are brought online as a single block.

When river flows reach approximately 16,000 cfs, flow in the canal system will be increased to a maximum of 6,600 cfs is reached - 6,000 cfs for generation and 600 cfs for fish passage operation. At this point all available generating stations on all three canal levels are able to generate.

### 3.1.2 Fall Passage

During fall fish passage season (generally September 16 - November 15), water is first dispatched to the canal system; the amount that is allocated will again depend on the river flow (Figure 3-2). When river flow is below 15,940 cfs, 400 cfs of water will be passed into the First Level Canal and be dispatched through HG&E's Holyoke 2 station into the Second Level Canal. From there, water will be passed through the Holyoke 3 and Riverside stations. Water from Holyoke 3 will enter the Third Level Canal, while flows from Riverside will be discharged into the Connecticut River. In the Third Level Canal flow will pass through the Chemical station and/or the No. 4 Overflow back into the river.

When river flows reach approximately 16,000 cfs, flows in the canal system will be increased to the maximum of 6,600 cfs - 6,000 cfs for generation and 600 cfs for fish passage operation. At this point, all available generating stations on all three canal levels are able to generate.

### 3.1.3 Habitat Flows

During the period of habitat flows (generally July 15 - September 15, and November 16 - March 31), water is again first dispatched to the canal system and the amount that is allocated depends on the river flow (Figure 3-3). When river flows are less than 11,400 cft, 400 cfs will enter the First Level Canal and is dispatched through HG&E's Holyoke 2 station into the Second Level Canal. From there, water is passed through the Holyoke 3 and Riverside stations. Water from Holyoke 3 enters the Third Level Canal, while water from Riverside discharges back into the Connecticut River. In the Third Level Canal, water is passed through the Chemical station, Sonoco station, and/or the No.4 Overflow back into the river.

When river flows reach 11,300 cfs, flow in the canal system is increased from 400 cfs to 2,200 cfs. Station dispatch is as noted above, but on the First Level Canal Parsons/Aubin and Boatlock Station are also brought online. On the Second Level Canal Station No. 5 and all eight Harris Projects are brought online as a single block.

When river flows reach approximately 15,000 cfs, flows in the canal system will be increased to a maximum of 6,000 cfs. At this point all available generating stations on all three canal levels are able to generate.

## 3.2 Canal Minimum Flow Plan

As noted above, LA 406 and the WQC requires that a minimum flow of 400 cfs be passed through the canal system downstream of the louver bypass system. Upstream of the louver bypass system, 440 cfs is required at the No. 1 Overflow during spring and fall upstream fish passage. The 440 cfs is the maximum flow for the upstream fish passage attraction facilities: up to 200 cfs at the spillway entrance and up to 120 cfs at each tailrace entrance. During downstream fish passage, 150 cfs bypass flow is required for the louver bypass system.

LA 406 and the WQC assigns the canal minimum flow the highest priority of any other flow release, including minimum flows into the bypass reach. Under low flow conditions, therefore, the first 400 cfs available will be passed through the canal system, as detailed in HG&E's Low Flow Contingency Plan, included in the COFP.

### 3.2.1 Canal Flow

After acquiring the project in December 2001, HG&E noticed that a significant amount of leakage existed in the canal system. Tests were performed to measure the leakage and HG&E has discovered approximately 300 cfs of leakage in the canal system. Most of the leakage appears to originate downstream of the louver bypass facility. The

volume of the water that is leaking through the canal system was determined by shutting down all generation on the canal and observing the headgate settings.

Since canal flow receives the highest priority, this leakage is significant. If leakage were not accounted for, during low flow conditions, the first 700 cfs would be diverted from the river to the canal system before discharging any water to the bypass reach. Including leakage in calculating minimum flows in the canal system provides more water in the bypass reach.

After reviewing this issue with the stakeholders, HG&E developed a study plan to verify flow distribution using the leakage component to achieve the 400 cfs minimum flow. The primary objectives of this study was to (1) determine flow patterns in Holyoke Project canal system, and (2) measure water quality in the canal system downstream of the louver bypass. To confirm that water is moving through the three levels of the canals, HG&E took field measurements to determine detectable water movement at various locations in each canal. Leakage or water movement in the canal system primarily occurs as water passes through a unit's wicket and/or headgates or through overflow waste gates. Measurements were taken at various roadway and footbridge crossings located throughout the canal system to record detectable velocity.

The study was originally performed in the summer of 2002, and based upon a review of the results, stakeholders agreed to allow leakage to be used to meet the canal minimum flow requirement. The results of the study showed that a total canal headgate opening of 60 inches provides 400 cfs of inflow to the canal, and that the existing inter-canal leakage in the system provided enough flow distribution so that detectible water velocities were measured at every sampling point in the study. To provide a means of compliance tracking, HG&E installed an Acoustic Doppler Current Profiler (ADCP) near Cabot Street nearly two-thirds of the way down the First Level Canal. The 2002 study results and conclusions were reflected in the Permanent Canal Minimum Flow Plan filed with FERC on June 30, 2004.

To ensure that the ADCP was calibrated properly, in the fall of 2004, HG&E recreated the minimum flow study that was performed in 2002. As described in the June 2004 Permanent Canal Minimum Flow Plan (at page 9), "[t]his allowed HG&E to document the exact discharge passing through the downstream end of the First Level Canal for future compliance. HG&E also observed the relative distribution of flows between the Second and Third Level Canals to verify acceptable conditions (i.e., that the majority of the flow remains in the Second Level Canal. The velocity meter at the Cabot Street Bridge was correlated to measure flow corresponding to the flow in the downstream end of the First Level Canal during the calibration exercise. The meter was tied to HG&E's gatehouse supervisory system, allowing constant monitoring and documentation of flow distribution within the canal system."

A total of 400 cfs was allowed into the canal (measured via canal headgate openings), and the velocity sampling points were again measured to prove that there was detectible water velocities throughout the canal system (see Figure 3.4). During this time, the portion of the canal near the ADCP was gauged to calculate the flow passing the sensor at that time. The reading from the ADCP and the gauging of the canal showed a flow of 111 cfs, a variance of only 5% from the calculated flow from the gauging. This variance is most likely due to irregular velocity paths at low flows in the canal.

The remaining 289 cfs of the 400 that entered the canal through the headgates passed through to the Second Level Canal via leakage paths between Boatlock Station and the sensor near Cabot Street.

### 3.2.2 Compliance Measures and Documentation

In accordance with LA 406(c)(1) and the WQC, HG&E will provide 400 cfs downstream of the louver bypass. This flow will be provided continuously, year-round, except during canal drawdown situations. The 400 cfs will be distributed through the canal system downstream of the louver bypass system via a combination of leakage and/or generation. In the future the amount of leakage may change as holes (wicket gate, headgate openings, overflow gate leakage, etc.) in the canal system, which may end up blocked and no longer leaking, or flow leaking through a faulty gate that suddenly closes and no longer leaks. For that reason, minimum flow in the canal system will be verified by maintaining a minimum flow 111 cfs at the ADCP. It has been shown that as long as 111 cfs passes the sensor near Cabot Street, there is adequate flow distribution throughout all three levels of the canal.

Compliance will be documented by maintaining logs of the readings of the canal flow sensor by Cabot Street on the First Level Canal. These readings are taken on a real-time basis, and are saved to the HG&E computer system in hourly increments.

As further stated in the Permanent Canal Minimum Flow Plan (filed in June 2004, at page 9): “As provided for under Section 4.3(c) of the Settlement, if significant modifications are made by HG&E or any other entity on the canal system that could change leakage or the distribution of flow in the canal system, HG&E will evaluate the magnitude and distribution of flows in the canal system, and then, in consultation with the stakeholders, will propose to MADEP a revision to the permanent canal system minimum flow compliance measures set forth herein, as necessary to achieve the resource management objectives and the minimum flow requirements.”

### 3.3 Need and Frequency of Drawdowns

WQC Condition 13(d) contains a provision to evaluate “the frequency and necessity of canal drawdowns.” Canal drawdowns are necessary to maintain facilities in the three-level system to ensure continued safe operation of the canal, the generating units, and fish passage facilities. HG&E typically performs two drawdowns each year, the first in the spring and the second in the fall.

The spring outage usually lasts one or two days and the longer fall outage typically lasts five to seven days. The spring drawdown has two purposes: (1) to prepare for the spring freshet via cleaning various structures and performing any emergency repairs, and (2) to inspect the canal system infrastructure and develop a scope of work for the fall drawdown. During the fall drawdown, HG&E typically performs maintenance to the gatehouse, four masonry canal overflows, sixteen active flow control gates, approximately four and one half (4.5) miles of canals (including eight miles of canal walls), the louver facility on the First Level Canal, and 31 active water wheel installations (see Table 2-1).

Based on the spring drawdown, HG&E will develop a scope of work, plan, and schedule the fall outage. To the extent possible, HG&E will include maintenance work planned by other owners on the canal system.

### 3.4 Canal Drawdown Procedure

HG&E will attempt to reasonably expedite work performed during future drawdowns, and will attempt to undertake such work in a manner that least impacts aquatic resources. Pursuant to LA 406(d)(2)(C) and Section 4.3(e) of the Settlement, HG&E will notify all canal water users and resource agencies prior to any scheduled (i.e., non-emergency) canal system outage. Below are HG&E’s drawdown procedures for the First and Second Level Canals.

#### 3.4.1 Permanent Canal System Outage Plan

Pursuant to LA 406(d) and Section 4.3 (e) of the Settlement Agreement, HG&E describes herein its permanent canal system drawdown procedures. HG&E will attempt to reasonably expedite work performed during future drawdowns, and will attempt to undertake such work in a manner that least impacts aquatic resources. HG&E will follow the procedures outlined below to maintain whatever flow is possible during the drawdowns. Below are HG&E’s drawdown procedures for the First and Second Level Canals.



### 3.4.2 First Level Canal

Stakeholders have expressed three concerns with conditions in the First Level Canal during drawdowns: (1) watering of mussel habit, (2) removal of sediment in front of Boatlock Station, and (3) placement of heavy equipment in the canal. The following discussion reiterates the measures described in the mussels section of the Threatened and Endangered Species Protection Plan (T&E Plan, as approved by FERC on June 6, 2003; 103 FERC ¶ 62,131) at Sections 5.1 (Habitat Enhancement) and 5.4.1 (First Level Canal Drawdown).

Following recommendations from USFWS and Trout Unlimited (TU) at the June 14 and 27, 2002 meetings (Appendix A), HG&E has attempted to mitigate any effects that may be caused by the dewatering of the First Level Canal by building a weir at the beginning of that canal just upstream of the railroad bridge. The weir spans the entire width of the canal, and is approximately three feet high, maintaining watered conditions approximately 930 ft into the First Level Canal. The result in wetted area is approximately 0.85 acres.

Another concern of the stakeholders was the practice of the prior owners of the Holyoke Project of hauling sediment from in front of Boatlock station and depositing it into the head of the First Level Canal branch. HG&E will use a clamshell to clean the area in front of Boatlock Station and remove the sediment and debris from the canal.

With the installation of the full depth louvers and a trashrake before the Spring 2003 drawdown, the need for heavy machinery in the canal and time it takes to remove debris at Boatlock has been significantly diminished. If heavy machinery should be necessary in the fixture, HG&E will walk the area and clear the area of any visible mussels then install cones to mark boundaries available to vehicular traffic in front of Boat Station during maintenance drawdowns.

### 3.4.3 Second Level Canal

The following discussion reiterates the measures described in the mussels section of the T&E Plan, Section 5.4.2 (Second Level Canal Drawdown).

During the Spring 2002 drawdown, modified procedures were utilized in an effort to provide the maximum amount of wetted canal floor in the Second Level Canal downstream of Boatlock Station. Stakeholders were on-site to observe the effects of these procedures, and all present were generally satisfied with the conditions. Therefore, the drawdown procedures are being replicated for future outages. HG&E will attempt to coordinate drawdown efforts with other station owners to maintain maximum wetted area.

Below are the general procedures HG&E will follow under normal (non-emergency) conditions:

- 1) Before the canal drain begins all HG&E and customer units except Boatlock and Riverside Stations must be shut down.
- 2) The canal headgates will be closed, beginning the canal drainage.
- 3) Boatlock Station units will be operated until the water level in the First Level Canal reaches approximately El. 92.5 (NGVD). After the water elevation reaches approximately El. 92.5 (NGVD), Boatlock feed gates will be opened to continue draining the First Level Canal.
- 4) One or more waste gates at the No. 1 Overflow will be opened to assist the draining process. These waste gates will have to be carefully regulated as to not overflow the fishway attraction system and/or allow the attraction water system and 4-ft diameter drain pipe to the Hadley tailrace to fill with debris.
- 5) The No. 2 Overflow will remain closed during the drawdown until the end, as maintenance activities require. Should HG&E find that the No. 2 Overflow does not maintain sufficient water levels, HG&E will consult with stakeholders about the feasibility of installing a weir in front of the No. 2 Overflow.
- 6) When the Second Level Canal reaches approximately El. 74.5 (NGVD), all but one of the Riverside station generating units will be secured. A unit on the Second Level will be operated at speed/no load to drain the Second Level Canal. This eliminates the previously employed step of securing all units at Riverside Station, opening penstock drain valves on Units 4 and 5. The waste gates at the No. 2 Overflow will be opened during the last 24 hours of the outage for inspection of both the civil works and safety on each unit. Drainage will occur slowly to allow for maximum wetting of the canal floor. Slow drainage typically takes 6-8 hours; emergency drainage lasts 2 hours.
- 7) The No. 3 Overflow will remain closed during the drawdown until the end, as maintenance activities require, maintaining pooled areas between Boatlock and Riverside.
- 8) The No. 4 Overflow gates will be opened to drain the Third Level Canal.

HG&E shall also develop a plan for evaluation of the experimental weir in the First Level Canal to determine if it retains water and to develop and implement plans to modify as required; and a plan for evaluation of the need for additional weirs to keep mussel habitat areas watered.

HG&E may need to occasionally deviate from the above drawdown procedure to perform essential maintenance work. This may include drawing the Second Level Canal down deeper to gain access to certain structures and equipment. These types of drawdowns are infrequent and HG&E will make all reasonable efforts to minimize the duration of the drawdowns.

Typically during drawdowns there is some leakage past the headgates, which serves to provide a minimal amount of flow through a portion of the canal system. To the extent it does not interfere with maintenance activities, HG&E will not completely seal off leakage past the headgates.

### 3.5 Full Depth Louver Operations

Pursuant to LA 408(b) in the April 2005 Order, HG&E shall continue to operate, clean and otherwise maintain the full depth louvers in the First-Level Canal and the exclusion racks at the attraction water intake gates to ensure efficient and reliable operation of these facilities for the protection of aquatic resources. HG&E shall annually inspect the full depth louvers and exclusion racks, and repair them as necessary. In the event the full depth louver facility is out of service during the Upstream Passage Season [defined in LA 406(a)(2)], the Canal System will not be operated and the headgates will be closed to seal flows into the Canal. If necessary, at the end of the Upstream Passage Season a slow drain of the Canal will be performed to return any fish to the River. In the unlikely event of a failure of the canal louver bypass system, HG&E shall shut the Canal down. If there is a structural failure of the louver panels, HG&E shall implement a slow drawdown process to allow any fish in the Canal downstream of the louver facility to return to the River. As described below, the process consists of: (i) notification, and (ii) slow draining of the canal system:

- (i) Notification: HG&E shall notify MADFW, USFWS and NOAA Fisheries within 24 hours of the louver bypass system outage.
- (ii) Slow Drain: The No. 1 Overflow attraction water gate will be cracked to drain the First Level Canal; the No.2 Overflow gates will be cracked to drain the 'upper' section of the Second Level Canal, and the Riverside Station sluice gate will be cracked to drain the 'lower' portion of the Second Level Canal. HG&E shall monitor the Canal System during the

slow drain process and regulate the drain gates as required to allow fish to exit the Canal System.

In conjunction with the slow drain process, HG&E shall make all reasonable efforts to expedite repairs to the louver bypass facility and return the facility to service.