

# Robert J. Bukowski, P.E., LEED® AP, CPESC®

## Principal Engineer/Department Manager



### Core Skills

- ▶ Mr. Bukowski is an experienced Project Manager of multi-discipline projects ranging from site design to environmental remediation to landfill closure/reuse. He has performed as project manager, lead design engineer, and engineer of record for a large variety of civil and environmental engineering projects.
- ▶ Mr. Bukowski's recent experience has focused on permitting and engineering associated with the development of over 50 MW of solar PV facilities at over 30 sites in the northeast US.
- ▶ Mr. Bukowski has managed the Engineering and Construction Management Department of Amec Foster Wheeler's Chelmsford, MA office for the past 8 years and has overall responsibility for engineering and construction projects performed out of the Massachusetts office.

### Professional summary

Mr. Bukowski has over 20 years of experience in management, design, permitting and construction of civil and environmental engineering projects. He is experienced in civil/site design, stormwater design/management, remediation design, landfill closure/redevelopment, and environmental compliance. He has extensive experience in design of site development projects (including erosion and sedimentation control design, stormwater management system design, and utility design); remediation design (including implementation of in-situ remediation technologies and soil excavation plans); landfill closure/redevelopment (including capping system design, landfill gas collection system design, leachate collection system design, and landfill redevelopment design); and environmental compliance (including SWPPP preparation, SPCC preparation, and local permit compliance). Mr. Bukowski also has extensive experience in performing construction oversight and construction inspections.

During Mr. Bukowski's tenure with Amec Foster Wheeler, he has served as Project Manager and Engineer of Record for federal, commercial, and industrial civil engineering and permitting projects, as well as soil and groundwater remediation projects. Most recently, Mr. Bukowski's experience has focused on the redevelopment of closed municipal landfills and greenfield sites as solar PV facilities. He has been involved in various phases of implementing these projects, including permitting, design, and construction of over 50 MW of solar PV in the northeast US.

Mr. Bukowski currently manages the Engineering & Construction Management Department in Amec Foster Wheeler's Chelmsford, MA office.

### Employment history

Amec Foster Wheeler, Principal Engineer/Department Manager, Chelmsford, MA, 2008 to present

David E. Ross Associates, Senior Project Manager, Ayer, MA, 2005 to 2008

TerraTherm, Project Manager, Fitchburg, MA, 2000 to 2005

Arthur D. Little, Consultant, Cambridge, MA, 2000

ENSR Consulting & Engineering, Project Manager, Acton, MA, 1995 to 2000

EMS Environmental, Project Engineer, Frederick, MD, 1993 to 1995

### Summary of Core Skills

Mr. Bukowski's design experience includes the management, design, permitting, and construction management of various civil design projects including: federal, commercial, industrial, and residential site design/land development, stormwater/drainage (conventional and low-impact development), layout and grading, utility design, landfill closure/landfill redevelopment, erosion and sedimentation control, and on-site sewage disposal systems. Project complexity ranged from conceptual design to phased design submittals including drawing and specification preparation for bid and construction documents. Most recently, Mr. Bukowski's focus has been on engineering and permitting of solar photovoltaic facilities on closed municipal landfills. Permitting experience

Years with Amec Foster Wheeler: 9

Years Experience: 24

### Education

M.S., Civil Engineering, University of Massachusetts, Lowell, 2000

B.S., Civil Engineering, Worcester Polytechnic Institute, 1993

### Professional qualifications

Professional Engineer: CT (26966), MD (43431), KY (26530), MA (41492), ME (11898), NH (12735), OH (74741), RI (9217)

LEED® Accredited Professional

Certified Professional in Erosion and Sediment Control (CPESC)

Licensed Soil Evaluator – Massachusetts (No. 2806)

OSHA 40 Hour Hazardous Waste Training and Annual Refresher Course

OSHA Hazardous Waste Site Supervisor Training

Massachusetts Registered Third-Party Underground Storage Tank Inspector (No. 1416)

### Memberships/affiliations

American Society of Civil Engineers, Member

### Location

Chelmsford, MA, USA

involved presentations of the designs at public hearings for local Planning Boards, Zoning Boards of Appeal, Boards of Health, and Conservation Commissions. In some cases, permitting included preparation of Notices of Intent (NOI) and Request for Determination of Applicability (RDA) for work within 100' of a wetland resource area. Permitting on the state and federal level includes erosion and sediment control permits, construction stormwater general permits, multi-sector (industrial) general permits, and remedial discharge general permits. Construction management included submittal/RFI review, quality assurance inspections, and general oversight. Mr. Bukowski has also developed Stormwater Pollution Prevention Plans (SWPPPs) for construction and industrial sites covered by NPDES General Permits.

#### Representative projects

**Bethel, Connecticut Landfill Solar Redevelopment, Ameresco, Inc.** Project Manager/Engineer of Record for the redevelopment of a closed landfill as a 948 kilowatt solar photovoltaic generating system. The project included engineering and permitting in order to obtain approval from CT DEEP for an Application for Disruption of a Solid Waste Disposal Area. Engineering evaluation included geotechnical analysis of bearing capacity, slope and sliding stability, and settlement; access road design; structural design of cast-in-place concrete inverter/transformer pads and conduit support blocks; and stormwater analysis to assess the increase potential increase in stormwater runoff volume and rate due to the proposed development. Local inland wetlands and planning/zoning board permit approval were also obtained.

**Ground-Mounted Solar PV Development, New England.** Project Manager/Engineer of Record on over 15 solar PV development projects in Massachusetts, Rhode Island, and New Hampshire. Services performed included constraints identification, wetlands delineation, topographic and ALTA survey, civil site design (roadways, layout, stormwater management), local and state permitting, and construction support.

**Hamilton Ontario Solar PV Landfill Feasibility Study, City of Hamilton, ON, Canada.** Senior reviewer/advisor for the feasibility study of solar PV at several landfill sites in the City of Hamilton. Developed criteria for feasibility screening including site features, environmental receptors, and potential interconnection. Screening evaluated over a dozen sites and criteria evaluation narrowed it down to two sites for further evaluation to include conceptual solar PV array design and detailed permitting evaluation.

**Pittsfield, Groton, Saugus, Northampton, Lenox, and Newton Landfill Solar Redevelopment, Ameresco, Inc., Massachusetts.** Project Manager for the redevelopment of a closed landfill ranging from 1.0 to over 3 megawatt solar photovoltaic generating systems. The projects are in various stages of permitting and include engineering and permitting in order to obtain a Post-Closure Use Permit through MassDEP. Engineering evaluation includes geotechnical analysis of bearing capacity, slope and sliding stability, and settlement; access road design; structural design of cast-in-place concrete inverter/transformer pads and conduit support blocks; and stormwater analysis to assess the increase potential increase in stormwater runoff volume and rate due to the proposed development. In addition to the Post-Closure Use Permit, additional permitting requirements include local wetlands and planning board approval; state historic commission and endangered species protection agency permitting, and federal coverage under EPA's NPDES construction general permit.

**Weston Landfill Solar Redevelopment, Ameresco, Inc., Weston, Massachusetts.** Project Manager and Engineer of Record for the redevelopment of a closed landfill as a 2.27 megawatt solar photovoltaic generating system. The project included engineering and permitting in order to obtain a Post-Closure Use Permit through MassDEP. Engineering evaluation included geotechnical analysis of bearing capacity, slope and sliding stability, and settlement; access road design; structural design of cast-in-place concrete inverter/transformer pads and conduit support blocks; and stormwater analysis to assess the increase potential increase in stormwater runoff volume and rate due to the proposed development. In addition to the Post-Closure Use Permit, additional permitting requirements included local wetlands and planning board permit approval. Construction oversight of earthwork activities on the landfill cap was also provided.

**MassDOT Solar PV Development, Ameresco, Inc., Massachusetts.** Project Manager and Engineer of Record for the civil engineering and environmental permitting of 10 sites within the MassDOT right-of-way including sites within the highway median, on highway embankments, and on land within highway interchanges. Civil engineering and surveying tasks included development of proposed site plans/erosion & sedimentation control plans, traffic management plans, highway alteration plans, and structural design of concrete equipment pads. Permitting included wetlands permitting, local site plan review, and development of Stormwater Pollution Prevention Plans as required by the USEPA's construction general permit. Construction inspections were performed for equipment pad installations and for compliance with wetlands permit conditions.

**Braintree Landfill Solar Redevelopment, Ameresco, Inc., Braintree, Massachusetts.** Project Manager and Engineer of Record for the redevelopment of a closed landfill as a 1.263 megawatt solar photovoltaic generating system. The project included engineering and permitting in order to obtain a Post-Closure Use Permit through MassDEP. Engineering evaluation included geotechnical analysis of bearing capacity, slope and sliding stability, and settlement; access road design; structural design of cast-in-place concrete inverter/transformer pads and conduit support blocks; and stormwater analysis to assess the increase potential increase in stormwater runoff volume and rate due to the proposed development. In addition to the Post-Closure Use Permit. Construction oversight of earthwork activities on the landfill cap was also provided. Post-construction inspections and reporting to MassDEP continue to be conducted monthly.

**Sudbury Landfill Solar Redevelopment, Ameresco, Inc., Sudbury, Massachusetts.** Project Manager and Engineer of Record for the redevelopment of a closed landfill as a 1.509 megawatt solar photovoltaic generating system. The project included

engineering and permitting in order to obtain a Post-Closure Use Permit through MassDEP. Engineering evaluation included geotechnical analysis of bearing capacity, slope and sliding stability, and settlement; access road design; structural design of cast-in-place concrete inverter/transformer pads and conduit support blocks; and stormwater analysis to assess the increase potential increase in stormwater runoff volume and rate due to the proposed development. In addition to the Post-Closure Use Permit, additional permitting requirements included submittal of an ANRAD, Site Plan Review, and NHESP clearance. Construction oversight of earthwork activities on the landfill cap was also provided.

**Solar Panel Racking System Structural Analysis, MP-tec, Somers, Connecticut.** Project Manager for the performance structural analysis and suggested design modifications for a proposed solar array racking system to be used at a development in Somers, CT. Analysis included review of the state building code and design modifications were suggested to meet code requirements.

**Lowell Landfill Solar Redevelopment, Ameresco, Inc., Lowell, Massachusetts.** Project Manager and Engineer of Record for the redevelopment of a closed landfill as a 1.502 megawatt solar photovoltaic generating system. The project included engineering and permitting in order to obtain a Post-Closure Use Permit through MassDEP. Engineering evaluation included geotechnical analysis of bearing capacity, slope and sliding stability, and settlement; structural design of cast-in-place concrete inverter/transformer pads and conduit support blocks; and stormwater analysis to assess the increase potential increase in stormwater runoff volume and rate due to the proposed development. Construction oversight of earthwork activities on the landfill cap was also provided.

**Town of Sudbury Landfill Regulatory Compliance, Sudbury, Massachusetts.** Project Manager and Engineer of Record for ongoing regulatory compliance including landfill gas data assessment and analysis, landfill gas passive waste and perimeter vent design, and landfill and transfer station operation and maintenance plan preparation.

**Town of Sudbury Landfill Cap Evaluation, Sudbury, Massachusetts.** Project Manager for the evaluation of the cap of a landfill that was closed without a permit from MassDEP. Several tasks were required by MassDEP in order for the Town to gain closure certification for the closed landfill. The project involved development of a sampling/evaluation plan including procedures for collecting cap material samples and associated physical soil property analysis of the materials on the top of the landfill and from beneath the adjacent recycling facility. This evaluation was required in order to assess whether the landfill was closed consistent with typical engineering practices of the time. In addition, existing methane gas sampling information was reviewed and compiled in order to develop a design for a passive landfill gas recovery system.

**Acton Landfill Solar Redevelopment, Ameresco, Inc., Acton, Massachusetts.** Project Manager and Engineer of Record for the redevelopment of a closed landfill as a 1.59 megawatt solar photovoltaic generating system. The project included engineering and permitting in order to obtain a Post-Closure Use Permit through MassDEP. Engineering evaluation included geotechnical analysis of bearing capacity, slope and sliding stability, and settlement; structural design of cast-in-place concrete inverter/transformer pads and conduit support blocks; grading design to maintain landfill slope requirements within the allowable limits for the ballast foundations; and stormwater analysis to assess the increase potential increase in stormwater runoff volume and rate due to the proposed development. MassDEP issued the permit in 2012. Amec Foster Wheeler provided construction inspection services during 2013. Construction oversight of earthwork activities on the landfill cap was also provided.

**Scituate Landfill Solar Redevelopment, Brightfields Development, LLC, Scituate, Massachusetts.** Provided senior QA/QC review for engineering design and construction services for the development of a 3.6MW system on the closed Town of Scituate landfill consisting of 13,000 photovoltaic modules on 583 ballasted racking assemblies designed to produce over 4,400MWh of sustainable electricity reducing greenhouse gas emissions by 2,709 metric tons annually.

**Pill Hill Landfill Solar Redevelopment, Bernards Township, New Jersey.** Civil engineer for the redevelopment of a closed municipal landfill as an approximately 4 megawatt solar photovoltaic generating system. The project consisted of an area of approximately 18 acres. Engineering analysis included stormwater management of runoff from the landfill and geotechnical analysis of landfill cap and piping stability with respect to concrete ballasted foundation placement on the cap. Additionally, engineering work included foundation loading and landfill slope stability.