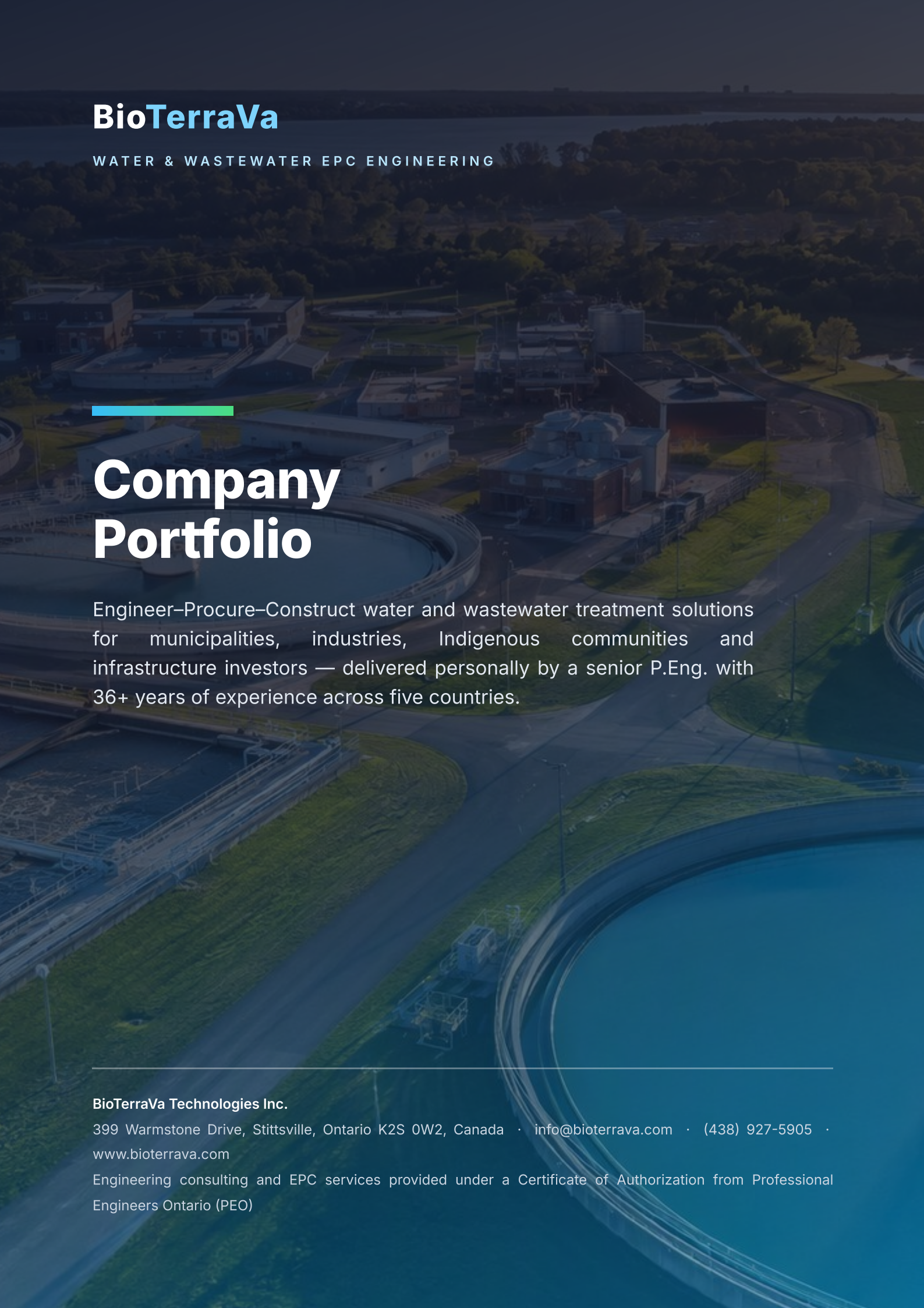




BioTerraVa

WATER & WASTEWATER EPC ENGINEERING

Company Portfolio

Engineer–Procure–Construct water and wastewater treatment solutions for municipalities, industries, Indigenous communities and infrastructure investors — delivered personally by a senior P.Eng. with 36+ years of experience across five countries.

BioTerraVa Technologies Inc.

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Engineering consulting and EPC services provided under a Certificate of Authorization from Professional Engineers Ontario (PEO)

01 • EXECUTIVE SUMMARY

Engineering Clean Water for Ontario's Future

BioTerraVa Technologies Inc. is a boutique engineering firm delivering Engineer–Procure–Construct (EPC) water and wastewater treatment solutions for municipalities, industrial operators, Indigenous communities and infrastructure investors — from one-day compliance audits to metropolitan plants treating 700,000 m³/day.

Founded in Ontario by **Medhat K. Gad, P.Eng., PMP®**, the firm pairs the accountability of a boutique practice with a track record few large firms can match: three and a half decades of hands-on plant design, expansion and operations leadership across Canada, the United States, Egypt, Saudi Arabia and Türkiye — including an EGP 760M national drainage rehabilitation program, a 140,000 t/yr sludge-to-fuel circular-economy contract, and a €16M waste-to-energy facility.

36+ YEARS OF EXPERIENCE	5 COUNTRIES SERVED	12+ INDUSTRIAL SECTORS	700K M ³ /DAY LARGEST SYSTEM
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Every engagement — feasibility study, capacity expansion, regulatory audit or turnkey EPC program — is scoped, engineered and delivered personally by the principal. Clients get senior expertise on every file, 24–48-hour response times, and effective rates unburdened by big-firm overhead.

02 · WHO WE ARE

A Boutique Practice With a Metropolitan Track Record

BioTerraVa was established to bring senior-level water infrastructure engineering back to its clients directly. At large consultancies, a partner wins the work and junior staff deliver it; BioTerraVa's model inverts that structure — one accountable professional engineer owns every file from first call to commissioning certificate.

Mission

To deliver compliant, resilient and affordable water and wastewater infrastructure for Ontario's municipalities, industries and First Nations — while converting yesterday's waste streams into tomorrow's resources through circular-economy engineering.

Vision

A water sector in which no plant needs new concrete to grow, no biosolid is landfilled, and no community — however remote — is without safe, operable treatment infrastructure.

Values

- **Senior accountability.** The engineer who signs the proposal is the engineer who delivers the work — personally, under a PEO Certificate of Authorization.
- **Compliance first.** Designs are engineered around MECP requirements — ECAs, WSER reporting and Municipal Class EA — from day one, not retrofitted.
- **Circularity.** Sludge, slag and nutrients are feedstocks, not liabilities — a philosophy proven at industrial scale and protected today by four provisional patents.
- **Community partnership.** Infrastructure succeeds only when local operators own it — training, mentorship and long-term support are built into every project.

"Treatment plants are receivers, not sources, of the contaminants they capture. The engineer's job is to close the loop — turning compliance burdens into recovered resources."

— Medhat K. Gad, P.Eng., PMP®, Founder & Principal

03 · LEADERSHIP

Medhat K. Gad, P.Eng., PMP® — Founder & Principal Engineer



A senior process engineer with 36+ years of delivery across five countries and 12+ industrial sectors — plants from 400 m³/day packaged systems to 700,000 m³/day metropolitan facilities.

- **B.Sc. Civil Engineering** — Cairo University
- **Professional Engineer (P.Eng.)** — Professional Engineers Ontario
- **Project Management Professional (PMP®)**
- **3 published papers** — Montreal · Berlin · Antalya
- **4 provisional patents** — circular water technology, under bench-scale validation at the University of Western Ontario with OCI and IPON support
- **MOH-accredited pyrolysis technology** — medical-waste pyrolysis accreditation, 2014

Career Timeline

1993 – 2000

Civil Engineer & CMMS Developer — Riyadh Sewage Treatment Project, Saudi Arabia

Coordinated operations & maintenance at one of the region's largest sewage complexes (360+ staff) and developed one of the water sector's first CMMS platforms — presented to the President of Egypt in 1999 and adopted by 10 Egyptian WWTPs.

2000 – 2010

Founder & CEO — EGACS, Egypt

Led the national "Computer for Every Student" program with Egyptian banks (100,000+ computers delivered) and built ERP platforms for government and transport clients in Egypt and Saudi Arabia.

2010 – 2017

Founder, Chairman & CEO — NADIC (Elwatanya Co.), Egypt

Developed the INNPT nano-material platform with Egypt's National Research Center, HBRC and ARC. Delivered 10 mobile INNPT treatment plants via JV with the Arab Organization for Industrialization; authored the EGP 760M Kitchener Drain rehabilitation design; signed the 8-year Lafarge sludge-to-fuel contract; earned MOH accreditation for medical-waste pyrolysis.

2017 – 2021**Co-founder & CTO — GP-AMG, Türkiye · CEO — AMG Enviro**

Built a €16M biomass pyrolysis facility in Düzce under an R&D protocol with Düzce University; piloted INNPT/ANOC nano-materials on textile, tannery and oil-drilling wastewaters; partnered with Genesis Water Technologies to establish EKO NANO TECH LLC in Florida.

2022 – TODAY**Founder & Principal — BioTerraVa Technologies Inc., Ontario**

Boutique P.Eng. practice under a PEO Certificate of Authorization, serving Ontario municipalities, industries and Indigenous communities, with four provisional patents in circular water technology under validation at Western University.

04 · SERVICES

Full-Lifecycle Water & Wastewater Engineering

Eight integrated service lines cover every stage of a treatment asset's life — from the first feasibility question to decades of optimized operation.

SERVICE 01

EPC Project Delivery

Full Engineer–Procure–Construct delivery of water and wastewater treatment plants, from concept to commissioning.

- Feasibility studies, conceptual & detailed process design
- Procurement, construction management & site supervision
- Design-build and EPC contracting for plants 400 m³/d to 700,000 m³/d
- Commissioning, performance testing & operator training

SERVICE 02

WWTP Expansion & Upgrades

Signature capability: rating, debottlenecking and expanding existing plants that have outgrown their design capacity.

- Plant capacity audits & process simulation (BioWin / GPS-X)
- Hydraulic debottlenecking & retrofit design
- BNR upgrades for tight nutrient limits
- Phased construction with zero interruption to operations

SERVICE 03

Industrial Wastewater Treatment

Process wastewater treatment across 12+ industrial sectors — from food & beverage to steel mills and refineries.

- Steel mill & metal finishing effluent — heavy metals removal
- Landfill leachate treatment systems
- Food & beverage, dairy, sugar & pharmaceutical wastewater
- Oil & gas produced water and refinery effluent

SERVICE 04

PFAS Strategy & Compliance

Source control, sampling programs and treatment roadmaps for PFAS and other contaminants of emerging concern.

- PFAS source tracking & industrial pretreatment audits
- GAC / ion exchange / membrane treatment selection
- Regulatory strategy for Ontario & federal guidelines
- Biosolids PFAS risk assessment

SERVICE 05**Biosolids & Resource Recovery**

Circular-economy biosolids engineering — digestion, dewatering, thermal processing and beneficial reuse.

- Anaerobic digestion & biogas enhancement
- Dewatering, drying & pelletization systems
- Nutrient recovery (struvite, biochar media)
- Beneficial reuse & NASM plan support

SERVICE 06**First Nations & Remote Systems**

Water and wastewater infrastructure for Indigenous and remote communities — designed for reliability and local operation.

- Packaged & modular treatment plants for remote sites
- Operator training & capacity building programs
- Funding applications (ISC, Green Infrastructure, ICIP)
- Long-term O&M support and remote monitoring

SERVICE 07**Compliance Audits & MECP Liaison**

ECA / EASR compliance audits, WSER reporting and Ministry liaison delivered personally by a senior P.Eng.

- Environmental Compliance Approval (ECA) applications & amendments
- WSER / MECP reporting and spill response support
- Environmental audits & ISO 14001 gap assessments
- Expert witness and peer review services

SERVICE 08**Operations & Asset Management**

Operations leadership, troubleshooting and asset management for municipal and industrial facilities.

- Plant troubleshooting & process optimization
- O&M manuals, SOPs and operator mentoring
- Asset management plans & lifecycle costing
- Interim operations management (teams up to 360+ staff)

05 · SECTORS WE SERVE

Four Fields of Excellence



Domestic / Municipal

Municipal WWTPs, small community systems, collection systems and domestic PFAS compliance — serving communities from 500 residents to 1.2 million.

- Municipal WWTP design & expansion
- Small community & lagoon systems
- Nutrient removal & BNR upgrades
- WSER / MECP compliance & funding applications



Industrial

Twelve-plus industrial sectors covered — food & beverage, dairy, oil & gas, textiles, sugar refineries, pharmaceuticals, metal finishing, steel mills and landfill leachate.

- Steel mill effluent & heavy metals
- Food & beverage / dairy processing
- Oil & gas / refining
- Landfill leachate treatment



Indigenous Communities

First Nations water and wastewater infrastructure — robust, operable systems designed with the community, backed by training and long-term support.

- Packaged drinking water plants
- Modular wastewater systems
- Operator training & certification
- ISC funding applications & long-term advisory



Investors & Infrastructure Funds

Technical partnership for investors, developers and infrastructure funds entering the water sector — from pre-acquisition due diligence to bankable feasibility and independent engineer services that protect capital through construction and operations.

- Technical due diligence & asset condition assessment
- Bankable feasibility studies & technology screening
- Independent / lender's engineer services
- PPP / P3 procurement support (DBFOM, design-build)

06 · TRACK RECORD

Projects at Every Scale, in Five Countries

A selection of flagship programs — from Canada's growing municipalities to one of the world's largest drainage rehabilitation programs.

PROJECT	LOCATION	SECTOR / TYPE	SCOPE & SCALE
Kitchener Drain Rehabilitation Program	Kafr El-Sheikh & Gharbia, Nile Delta, Egypt	Domestic Industrial	+ INNPT nano-technology integration design to rehabilitate plants on one of the world's most polluted drains — quadrupling capacity within existing footprints. 700,000 m³/day — EGP 760M program.
Mobile WWTP Fleet — Ministry of Environment	Cairo, Egypt	Modular / Mobile	Technology developer and JV partner with the Arab Organization for Industrialization: design, manufacture, delivery and handover of 10 mobile INNPT plants × 100 m³/day for unserved villages.
Sludge-to-Fuel Program with Lafarge	Greater Cairo, Egypt	Resource Recovery	Eight-year JV with the Greater Cairo Sewage Authority converting sewage sludge into alternative fuel for cement kilns — 140,000 tons/year, 8-year contract.
INTEC WWTP Capacity Upgrade	Cairo, Egypt	Domestic Municipal	Nano-technology retrofit design quadrupling plant capacity within the existing footprint — proof that expansion doesn't always mean new concrete. 5,000 → 20,000 m³/day.
Riyadh Sewage Treatment Project (RSTP)	Riyadh, Saudi Arabia	Domestic Municipal	Seven years coordinating operations & maintenance; developed one of the region's first CMMS platforms — adopted by 10 Egyptian WWTPs and presented to the President of Egypt in 1999. 360+ staff O&M organization.

GP-AMG Waste-to-Energy Facility	Düzce, Türkiye	Waste-to-Energy	Co-founder & CTO: environmental licensing, design, erection and operation of a biomass pyrolysis facility producing charcoal, wood vinegar and power — R&D protocol with Düzce University. €16M — 60K t/yr charcoal, 70K MWh/yr.
Ontario Municipal WWTP Expansions	Ontario, Canada	Domestic Municipal	Capacity audits, ECA amendments and expansion design for growing Ontario municipalities. 400 – 50,000 m³/day.
Steel Mill Effluent Program	Ontario, Canada	Industrial — Heavy Metals	Heavy metals source control and end-of-pipe treatment strategy for integrated steel operations — a multi-outfall industrial program.
First Nations & Water Wastewater Systems	Ontario, Canada	Indigenous Communities	Packaged treatment plants designed for remote operability, winterization and local capacity building, with ISC funding application support.



Figure 2 — Advanced treatment infrastructure — MBR, tertiary filtration and process intensification retrofits.

07 · INNOVATION & IP

Circular Water Technology, Protected

Four provisional patents form one integrated circular platform — converting waste streams into treatment media, recovered nutrients and energy. All are under bench-scale validation at the University of Western Ontario, with support from Ontario Centre of Innovation (OCI) and IPON.

BOFS Valorisation

Converts basic oxygen furnace steel slag waste into premium water treatment media — dual revenue from one waste stream.

VASCGBC-M Media

Engineered biochar media with 10–12× phosphorus loading versus conventional biochar and demand-triggered nutrient release.

Terra BPC Process

Three-output circular pyrolysis: biochar + wood vinegar + syngas produced from municipal biosolids.

Integrated Circular System

BOFS + VASCGBC-M + Terra BPC combined in one circular platform with anaerobic digestion biogas enhancement.

Selected Publications

- **"INNPT Nano Particles Material Technology as Enhancement Technology for Biological WWTP Performance and Capacity"** — International Conference on Wastewater Treatment Technologies, Berlin, 2020; *Int. Journal of Environmental and Ecological Engineering*, Vol. 14 No. 7. Capacity increases up to 4× within existing footprints; tertiary-quality effluent in under one hour.
- **"Innovated Nano Particles Material as Advanced Oxidizing Nano Material for Textile Wastewater Treatment for Reuse"** — 22nd ICWT, Montreal, 2020. Real Turkish textile effluents: 92% COD, 95% TSS, 98% colour removal with a 10-minute mix and 30-minute settling process.
- **"Sewage Sludge Thickening and Stabilization using ECO NADIC HMR / 3S Alkaline Additives"** — CAMS, Antalya, 2014; DOI 10.15242/IICBE.C514089. 30% cake solids in 30 minutes; EPA Class A fertilizer in 72 hours — verified by Egypt's HBRC and Agriculture Research Center.

08 · WHY BIOTERRAVA

Boutique P.Eng. Expertise, Without the Big-Firm Overhead

At large firms, a senior engineer sells the engagement and junior staff deliver it. At BioTerraVa, Medhat Gad, P.Eng., PMP® delivers every engagement personally — 36+ years of hands-on plant design, expansion and operations leadership on every file.



Figure 1 — EPC delivery in progress — process design, procurement and construction under one accountable P.Eng.

WHAT MATTERS	BIOTERRAVA	TYPICAL LARGE FIRM
Who delivers the work	Medhat Gad, P.Eng. — personally, every engagement	Senior sells it; junior staff deliver it
Response time	24-48 hours; proposal in 3-5 business days	Weeks to mobilise; 3-6 week proposal process
Effective rate	CAD \$200-\$325/hr — no overhead markup	CAD \$250-\$400/hr blended, padded with overhead
Accountability	One P.Eng. signs, designs and commissions under a PEO Certificate of Authorization	Responsibility diffused across departments and sub-consultants
Technology access	Four provisional patents in circular water technology, validated with Western University	Proprietary systems sold through vendor partnerships

Regulatory & Quality Credentials

- Engineering services provided under a **Certificate of Authorization, Professional Engineers Ontario (PEO)**
- Principal holds **P.Eng.** (Ontario) and **PMP®** designations
- Deep working knowledge of MECP frameworks: ECA / EASR, WSER, Municipal Class EA, NASM, DWWP
- Funding application experience: Investing in Canada Infrastructure Program (ICIP), Green Infrastructure, Indigenous Services Canada

09 · CONTACT

Start With a Free 30-Minute Consultation

Every engagement begins the same way: a free, no-obligation consultation with the principal engineer to scope your problem and outline the lowest-cost path to compliance. A P.Eng. responds within one business day.

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