BIOLOGICAL SLUDGE REMOVAL
Sewage Treatment Plants / Lagoons

BIO-AUGMENTED SLUDGE DIGESTION

What is Biological Sludge Removal?

Most Sewage Treatment Plants waste sludge to holding tanks or ponds. This sludge is very volatile - high in organics and up to 80% nitrogens. The sludge is typically stored in anaerobic conditions for a period of months or years and is then mechanically pumped out, dewatered and disposed on land or taken to landfills at major cost to Clients.

Biological Sludge Removal (BSR) is the addition of Nitrogen cycle specific bacteria (For Earth Bio®) to reduce volatile solid volumes in your stored sludge. Biological sludge reduction significantly reduces sludge volumes to be mechanically removed and in some cases eliminates mechanical sludge removal for many years.

Biological sludge reduction can be accelerated with the addition of the For Earth floating diffused aeration system. The aeration provides Dissolved Oxygen that amplifies aerobic nitrifying bacteria. The added benefit of installing aeration in sludge ponds (especially at IDEA STP's) is that the aerobic condition prevents phosphorus release by Phosphorus Accumulating Organisms that would normally return phosphorus to the main IDEA tank and then discharge to environment during decant.

The combined use of the For Earth aeration and bacteria product will significantly reduce sludge loads in-situ at your sewage treatment plant which reduces operating costs and OH&S issues when compared to mechanical removal. The reduction of Volatile Solids in your sludge enables a more suitable inert odourless sludge for dewatering and disposal.

If your plant has fully loaded sludge storage ponds or tanks then please read the following case studies. We have independent technical papers that can be supplied on request.

If you have any questions please don't hesitate to contact me directly.

Best regards

Shane Mckibbin
Manager

For Earth Pty Ltd **(since 2004)**
Bay 2, No1 Merrigal Rd
Port Macquarie NSW
Tel: 02 65814353
E:shanem@forearth.com.au

PROJECT FILE

Biological Sludge removal – Oxidation pond

Wastewater Solutions

Client	**Council**
Location	NSW
Sewage Treatment Process	Oxidation Ponds - since 1991
Est daily flow (DWF)	350,000L
Population	1400
Issues	Sludge Build up in ponds / algae blooms / water quality
Works installed	Installation of For Earth probiotic dosing and low energy aeration system
Install Date	20/01/2014
Description	Council had been quoted $500K to mechanically desludge oxidation ponds 1 and 2. Council Management met with For Earth to discuss using our Low energy floating diffused aeration system and automated bacteria dosing system to biologically desludge these two ponds. Council after review of other project data proceeded with the For Earth Proposal. After 6 months sludge levels/volume had reduced av of 80% independently monitored. Total cost to Council $50K Cap exp and $12K in bacteria. The Council continue with the system and achieving many other benefits in odour and algae reduction.

For further details email: shanem@forearth.com.au

www.forearth.com.au

PROJECT FILE

Biological and Aerobic sludge digestion – Sludge Storage lagoon

Wastewater Solutions

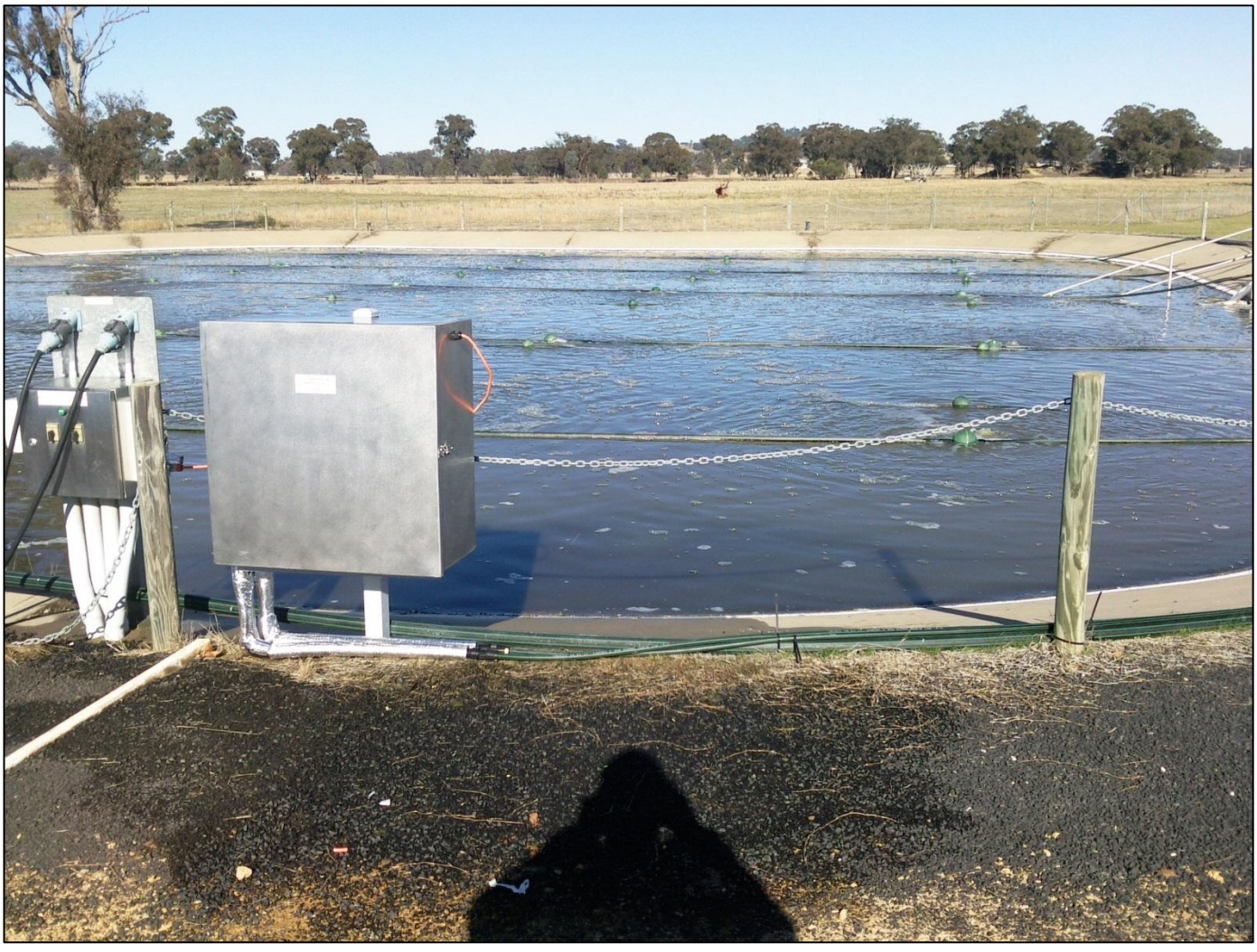
Client	**Council**
Location	NSW.
Sewage Treatment Process	Sequence Batch reactor, WAS transferred to sludge storage ponds then drying beds
Est daily flow (DWF)	2,200,000L, 12,000EP.
WAS/day	16kL per day wasted to lagoons, MLSS 2,800mg/L
Issues	Sludge storage ponds full resulting in poor quality supernate return to inlet. Drying beds full due to rainfall.
Works installed	Installation of For Earth low energy aeration system and bacteria dosing system
Install Date	August 2009
Description	Client was able to reduce sludge transfer to drying beds by 54% and over the period of 6 months obtained a buffer in the sludge storage lagoons. See Conference paper for complete details. Added benefits are: Phosphorus remains in the sludge and does not build up in SBR /decant but is transferred with sludge to drying beds, no odours and less Alum required.

For further details email: shanem@forearth.com.au

PROJECT FILE

Wastewater Solutions

Client	**Council**
Location	NSW.
Sewage Treatment Process	Intermittent, Decant Extended Aeration (IDEA) Sludge wasted to storage ponds.
Est daily flow (DWF)	500,000L, 2,500EP.
WAS/day	4kL per day wasted to lagoons, MLSS 2,800mg/L
Issues	Sludge storage ponds full resulting in poor quality supernate return to inlet. Cost of mechanical removal and disposal of dewatered sludge
Works installed	Installation of For Earth low energy aeration system and bacteria dosing system
Install Date	June 2010
Description	IDEA treatment process, WAS transfer to storage ponds filling quickly, difficult to organise pump outs. Client installed the For Earth Aeration and bacteria dosing system to desludge online sludge pond. Client has been able to extend sludge storage pond to 2 years instead of 9 months before mechanical removal.



For further details email: shanem@forearth.com.au

PROJECT FILE

Wastewater Solutions

Client	**Council**
Location	NSW.
Sewage Treatment Process	Intermittent, Decant Extended Aeration (IDEA) Sludge wasted to storage ponds.
Est daily flow (DWF)	400,000L, 2,000EP.
WAS/day	4kL per day wasted to lagoons, MLSS 2,800mg/L
Issues	Sludge storage ponds full resulting in poor quality supernate return to inlet. Cost of mechanical removal and disposal of dewatered sludge
Works installed	Installation of For Earth low energy aeration system and bacteria dosing system
Install Date	January 2009
Description	IDEA treatment process, WAS transfer to storage ponds filling quickly. Client installed the For Earth Aeration and bacteria dosing system to desuldge offline sludge pond. Monitored VS% and after 5 years ponds have had their first sludge removed mechanically. (very cold climate)

For further details email: shanem@forearth.com.au

www.forearth.com.au

PROJECT FILE

Wastewater Solutions

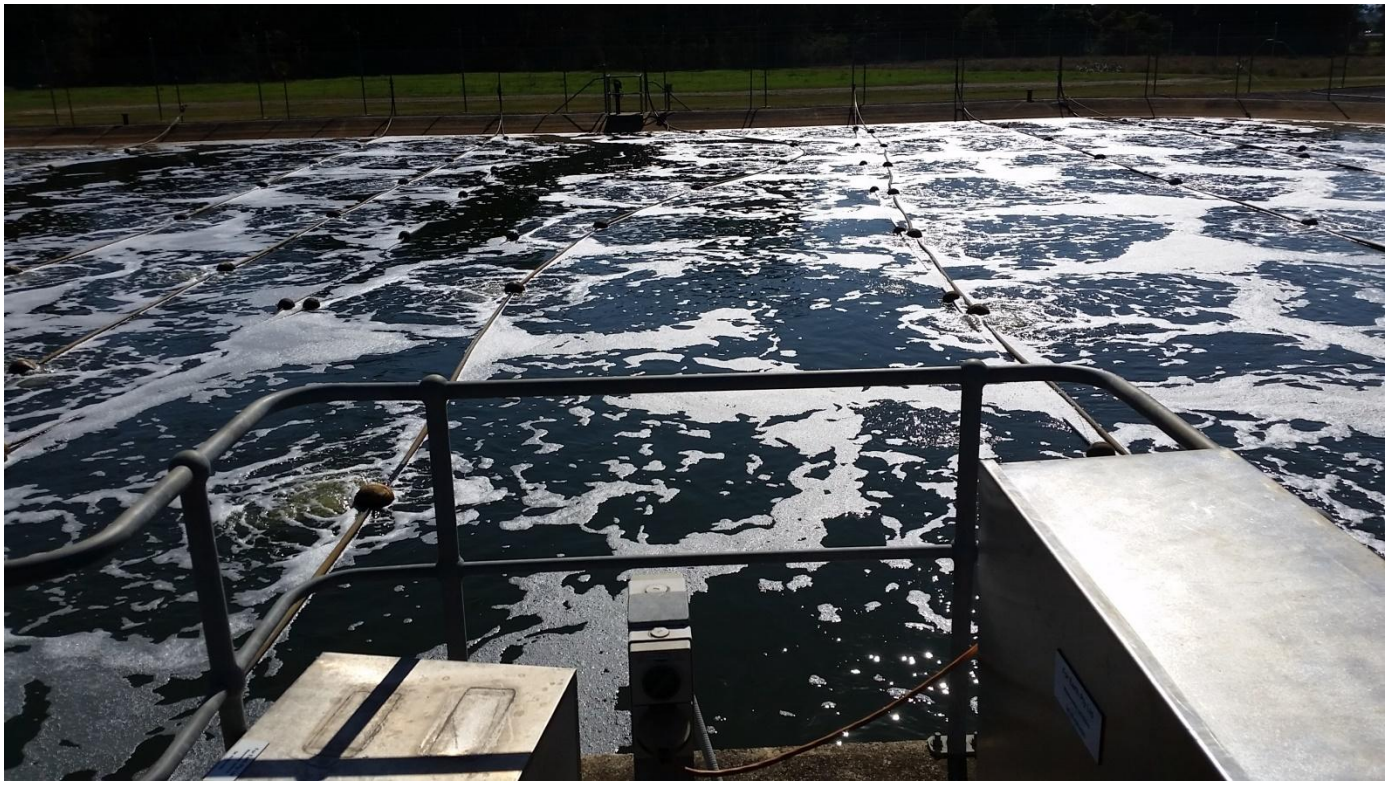
Client	**Council**
Location	NSW
Sewage Treatment Process	Digestor, trickle filters and anaerobic sludge storage lagoon.
Est daily flow (DWF)	1,400,000L, 7,000EP.
WAS/day	Twice a week from digestor.
Issues	Client looking for more economical and environmental solution for sludge removal and odour control.
Works installed	Installation of For Earth low energy aeration system and bacteria dosing system. Convert anaerobic sludge lagoon to aerobic process.
Install Date Results	January 2013 Lagoon was mechanically desludged in Feb 2017. The lagoon prior to installation of the For Earth System required mechanical desludging every 12 months. The aeration and bacteria ding system extended this to over 3 years.

For further details email: shanem@forearth.com.au

PROJECT FILE – Sludge Reduction

Wastewater Solutions

Client	**Council**
Location	NSW
Sewage Treatment Process	Screening, IDEA process (Diffused aeration) WAS to sludge holding ponds, Catch Bal. Sludge transfer to drying beds x 2..
Est daily flow (DWF)	900,000L, 3,000EP.
Issues	The two sludge holding ponds full and drying beds full. Mechanical sludge removal required every 12-18 months by outside contractor.
Works installed	Installation of For Earth diffused aeration system and bacteria (Nitrogen Cycle) dosing system into sludge holding pond 1.
Install Date Results to date	May 2009 Operator has been able to use his 2 drying beds over summer and not require outside dewatering contractor. Aerobic treated sludge dewatering within 7-9 days. Less Alum being used. No odours.



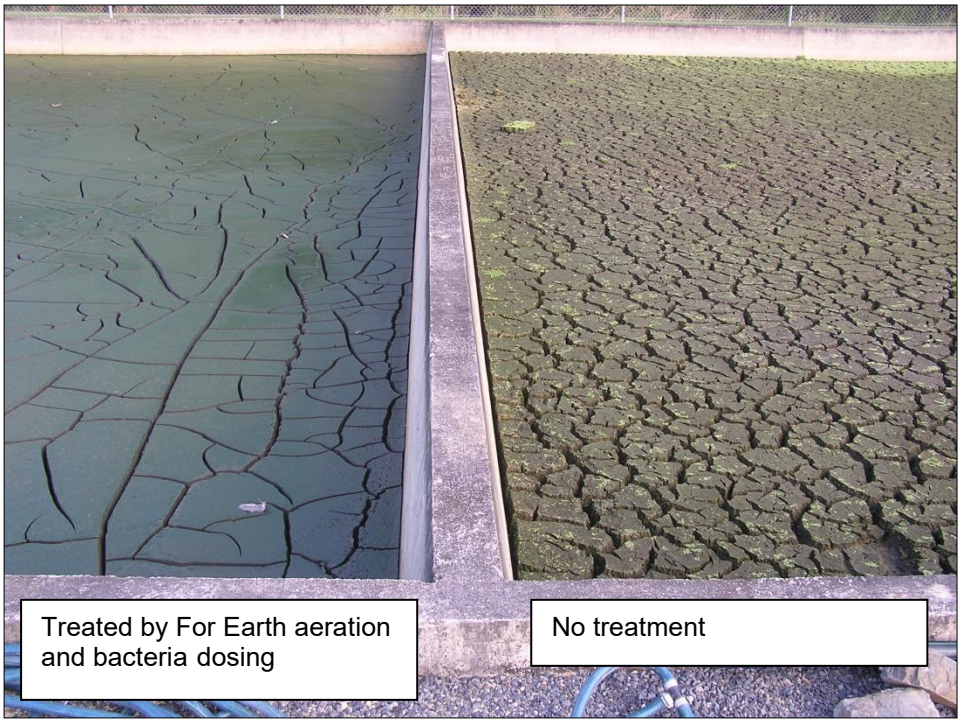
Above: WAS sludge holding pond 1 with For Earth treatment. Aerobic sludge digestion.

For further details email: shanem@forearth.com.au

For Earth Biological Sludge Reduction

Nambucca Council where the first sewage treatment plant to use the For Earth Biological sludge reduction system in Australia at their Macksville Plant. The Plant is an IDEA design and has two sludge storage lagoons the exact same dimensions. Both sludge lagoons where at near sludge capacity In 2008 For Earth installed our aeration and bacteria dosing system into one of the sludge lagoons for 4 months.

The photos below show sludge after it has been dewatered in the drying beds and also a profile picture of the two sludge samples.



Left;
This photo compares the profile of the two sludge samples. Left: For Earth aeration and bacteria dosing Right: No treatment.

Benefits of the treated sludge are reduced volume and faster dewatering periods.

For Earth Pty Ltd **(since 2004)**
Bay 2, No1 Merrigal Rd
Port Macquarie NSW
Tel: 02 65814353
E:shanem@forearth.com.au