Extract of Primozone Reference List for Ozone Systems Installations – 30 x Municipal Drinking Water References

USA

1. San Luis Obispo WTP in San Luis Obispo, California, USA
   - 6 x Primozone® GM48 (17.28 kg/h - 900 ppd)
   - Commissioning 2021
   - Plant capacity: 3031 m^3/h = 16 MGD
   - Pre-ozonation process capable of achieving disinfection credit requirements
   - Dissolution system = diffusers
   - Surface + ground water source

2. Clarksville WTP in Clarksville, Arkansas, USA
   - 4 x Primozone® GM48 (11.52 kg/h - 600 ppd)
   - Commissioning 2021
   - Plant capacity: 3031 m^3/h = 16 MGD
   - Primary disinfection, advanced treatment of drinking water, removal of cryptosporidium
   - Dissolution system = diffusers
   - Surface water

3. Plum Creek WTP in Castle Rock, Colorado, USA
   - 3 x Primozone® GM48 (8.64 kg/h - 450 ppd)
   - Commissioning 2021
   - Plant capacity: 1212 m^3/h = 6.4 MGD
   - Pre-ozonation of raw water and intermediate ozonation post membranes
   - Dissolution system = side-stream injection
   - Ground water

4. Herington WTP, Kansas, USA
   - 2 x Primozone® GM18 (2.16 kg/h - 114 ppd)
   - Commissioning 2022
   - Plant capacity: 136 m^3/h = 600 GPM
   - Pre-ozonation to reduce DBP formation
   - Dissolution system = side-stream injection
   - Surface water

5. Twin Creeks WTP in Heber City, Utah, USA
   - 2 x Primozone® GM12 (1.44 kg/h - 76 ppd)
   - Commissioning 2021
   - Plant capacity: 158 m^3/h = 1 MGD
   - Taste and odor improvement + disinfection credits
   - Dissolution system = static mixer + diffusers + serpentine pipeline contactor
   - Surface water

6. Mt Clemens WTP in Mt Clemens, Michigan, USA
   - 1 x Primozone® GM48 (2.88 kg/h - 150 ppd)
   - Commissioning 2020
   - Plant capacity: 552 m^3/h = 3.5 MGD
   - Reduction of total trihalomethane (TTHM)
   - Dissolution system = diffusers
   - Surface water

7. Borough of Lewistown, WTP, Pennsylvania, USA
   - 2 x Primozone® GM48 (5.76 kg/h - 300 ppd)
   - Commissioning 2019
   - Plant capacity: 950 m^3/h = 6 MGD
   - Disinfection
   - Dissolution system = side-stream injection
   - Surface water

8. Worcester WTP, Massachusetts, USA
   - 8 x Primozone® GM48 (23.04 kg/h - 1216 ppd)
   - Phase 1 - Commissioning 2019; Phase 2 – Commissioning 2020
   - Plant capacity: 7900 m^3/h = 50 MGD
   - Pre-ozonation
   - Dissolution system = bubble diffusers
   - Surface water

Replacement of existing PCI ozone system. Upgrade from air-fed low-concentration highly energy consuming ozone system to LOX-fed high-performance high-concentration system.

9. Canyon River Regional Water (Lake Dunlap), WTP, Texas, US
   - 5 x Primozone® GM48 (13.6 kg/h - 720 ppd)
   - Commissioning 2017
   - Plant capacity: 2500 m^3/h = 16 MGD
   - Ozone injected after membrane filtration
   - Dissolution system = side-stream injection
   - Surface + ground water source

Ozone is used to oxidize DOC remaining after filtration, a precursor to THMs formation. Ozone also controls taste and odor caused by algal growth in the lake supply during summer months, eliminates cryptosporidium and other biological content in finished water.

10. City of Wrangell WTP, Alaska, US
    - 2 x Primozone® GM48 (5.44 kg/h - 288 ppd)
    - Commissioning 2016
    - Average flow: 95 m^3/h = 0.6 MGD
    - Ozone is the first treatment step of the process
    - Dissolution system = side-stream injection
    - Surface water

11. Canyon River Regional Water, WTP, Texas, US
    - 1 x Primozone® GM48 (2.72 kg/h - 144 ppd)
    - Commissioning 2015
    - Plant capacity: 400 m^3/h = 2.5 MGD
    - Ozone injected after membrane filtration
    - Dissolution system = side-stream injection
    - Full-scale pilot (part of the main stream). Evaluation of technology, ozone demand
    - Surface + ground water source

12. Fisher Ferry WTP, Vicksburg, Mississippi, US
    - 2 x Primozone® GM48 (5.44 kg/h - 288 ppd)
    - Commissioning 2015
    - Average flow: 159 m^3/h = 1 MGD
    - Ozone removes color from the water and gases
    - Dissolution system = side-stream injection
    - Ground water

13. Farmington WTP, Utah, US
    - 1 x Primozone® GM12 (0.72 kg/h - 38 ppd)
    - Commissioning 2015
    - Average flow: 136 m^3/h = 600 GPM
    - Ozone oxidizes Hydrogen Sulfide
    - Dissolution system = side-stream injection
    - Ground water

14. East Dallas WTP, Texas, US
    - 1 x Primozone® GM18 (1.02 kg/h - 54 ppd)
    - Commissioning 2014
    - Plant capacity: 53000 m^3/h = 280 MGD
    - Ozone is the main disinfectant
    - Pilot: part of the mainstream for evaluation of the technology
    - Surface water

15. Town of Wellington WTP, Kansas, US
    - 2 x Primozone® GM24 (2.88 kg/h - 152 ppd)
    - Plant capacity: 726 m3/h = 4.6 MGD
    - Taste & Odor removal, ozone before BAC filtration
    - Dissolution system = side-stream injection
    - Surface water

Canada

16. Portage la Prairie WTP in Manitoba, Canada
    - 3 x Primozone® GM48 (8.64 kg/h - 450 ppd)
    - Commissioning 2021
    - Plant capacity: 1417 m^3/h = 9 MGD
    - Disinfection before GAC filtration
    - Dissolution system = diffusers
    - Surface water

17. L'Île-Perrot WTP, Quebec, Canada
    - 2 x Primozone® GM36 (4.32 kg/h - 228 ppd)
    - Commissioning 2019
    - Plant capacity: 917 m^3/h = 6 MGD
    - Pre-ozonation - Ozone injected upstream of the decanters
    - Dissolution system = side-stream injection
    - Surface water

South America

18. Consorcio Valle San Nicolas, WTP, Colombia
    - 1 x Primozone® GM36 (2.04 kg/h – 107 ppd)
    - Commissioning 2016
    - Plant capacity: 720 m^3/h = 4.5 MGD
    - Ozonation of drinking water for elimination of cyanobacteria, ceratium, giardia and cryptosporidium
    - Dissolution system = deep mounted dome diffusers, down to 12-15m (35-45 ft)
    - Surface water

Europe

19. Langevatn WTP, Stavanger, Norway
    - 20 x Primozone® GM48 (54.4 kg/h - 2880 ppd)
    - Commissioning 2020
    - Plant capacity: 10000 m^3/h = 63 MGD
    - Ozone is the first step of the treatment process
    - Dissolution system = static mixing system with pre-dispersion loops + channel mixer
    - Ground water

20. Muttenz WTP, Basel, Switzerland
    - 2 x Primozone® GM18 (2.04 kg/h – 107 ppd)
    - Commissioning 2016
    - Plant capacity: 150 m^3/h = 950.000 GPD
    - Ozone injected in AOP reactors
    - Dissolution system = HiPOX system from APT Water in 20 different injection points in each of the two reactors with help of direct injection at 2.9 bar(g)
    - Ground water

21. SEBES, WTP, Luxembourg
    - 4 x Primozone® GM18 (4.08kg/h – 216 ppd)
    - Commissioning 2015
    - Plant capacity: 3000 m^3/h = 25 MGD
    - Ozone is the first step of the treatment process
    - Dissolution system = diffusers

System built in an insulated 20ft container

22. Hallstavik WTP, Sweden
    - 2 x Primozone® GM12 (1.36 kg/h – 72 ppd)
    - Commissioning 2015
    - Plant capacity: 240 m^3/h = 1.5 MGD
    - Ozone for COD reduction and taste & odor improvement
    - Dissolution system = side-stream injection

23. Flate WTP, Bamble, Norway
    - 3 x Primozone® GM18 (3.06kg/h – 162 ppd)
    - Commissioning 2014
    - Plant capacity: 680 m^3/h = 4.3 MGD
    - Ozone injected as the first step of the process, just before the bio filtration
    - Dissolution system = side-stream injection with horizontal ozone reactors

24. Acomb Landing, WTP, UK
    - 3 x Primozone® GM18 (3.06kg/h – 162 ppd)
    - Commissioning 2012
    - Plant capacity: 1460 m^3/h = 9 MGD
    - Ozonation of raw water (main aim = removal of pesticides)
    - Dissolution system = side-stream injection

25. Åland Dalkaraby, WTP, Finland
    - 2 x Primozone® GM18 (2.04kg/h – 108 ppd)
    - Commissioning 2007
    - Plant capacity: 475 m^3/h = 3 MGD
    - Pre-ozonation before flocculation and post-ozonation before GAC filtration
    - Dissolution system = side-stream injection

The turnkey delivery consisted of two independent lines.
Part of the ozone from 2 pcs. of Primozone GM18 supports the flocculation process for humus, meaning that less chemicals needs to be used in the first filtration step.
Part of the ozone from 2 pcs. of Primozone GM18 is used to create a barrier killing bacteria's, virus, algae's and parasites. The biological waste is then filtered out via GAC.

26. Ljungskile, WTP, Sweden
    - 2 x Primozone® GM18 (2.04kg/h – 108 ppd)
    - Commissioning 2006
    - Pre-ozonation before flocculation and post-ozonation before GAC filtration
    - Dissolution system = side-stream injection

First Primozone installation. The ozone system is no longer operating because the whole drinking WTP was dismissed.

Asia

27. Yoma, WTP, Myanmar
    - 1 x Primozone® GM24 (1.36 kg/h – 72 ppd)
    - Commissioning 2016
    - Plant capacity: 82 m^3/h = 520.000 GPD
    - Ozonation of raw water
    - Dissolution system = Statiflo static mixer
    - Ground water

28. Cheuong-Ju, WTP, South Korea
    - 6 x Primozone® GM48 (16.32kg/h – 864 ppd)
    - Commissioning 2017
    - Plant capacity: 4300 m^3/h = 27 MGD
    - Ozone injected after membrane filtration
    - Dissolution system = main stream diffusers + static mixing system

29. Gulpo, WTP, South Korea
    - 6 x Primozone® GM48 (17 kg/h – 900 ppd)
    - Commissioning 2019
    - Plant capacity: 3631 m^3/h = 23 MGD
    - Ozone is used for color, taste, odor removal, oxidation of organic matter, sterilization, disinfection
    - Dissolution system = main stream diffusers + static mixing system

30. Ulsan-si Hoeya2 drinking water treatment plant
    - 12 x Primozone® GM48 (35 kg/h – 1800 ppd)
    - Commissioning 2019
    - Plant capacity: 11250 m^3/h = 71 MGD
    - Ozone is used for color, taste, odor removal, oxidation of organic matter, sterilization, disinfection
    - Dissolution system = main stream diffusers + static mixing system