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PRESSURELESS™ OZONE WATER PURIFICATION SYSTEMS

## Ozonation System Installation Four Way WSC Huntington, Texas

*Huntington, Texas is a community with a population of about 2,000. Located in the timberlands of East Texas, the town's economic mainstays are lumber and farming.*

*Four Way Water Supply Corporation is the sole source of the town's water supply.*



### CHALLENGE

A new Stage 1 Disinfection Byproduct Rule put into effect in January 2004 meant that Four Way WSC's water purification method had to comply with a maximum contaminant level for total trihalomethanes (TTHMs). The water from one WSC well exceeded the maximum allowable TTHM level.

WSC's old process successfully removed color, but did not achieve compliance with the new TTHM standard. WSC had to find a new, economical water treatment process that would remove color and reduce the TTHM level.

### SOLUTION

A Model N-350 Ozonation System installed at the well creates ozone from ambient air. The ozone is then mixed with the well water, which purifies and removes color from the water.

### RESULTS

The Ozone Technology Model N-350 Ozonation System is safely, efficiently, and dependably removing color from the water and reducing the TTHM to virtually undetectable levels, easily complying with contaminant rules.

In addition, chlorine usage has been reduced from 26 pounds per day to 5 pounds per day.

The Ozonation System enables Four Way WSC to provide customers with tap water that is clean, clear, and safe.

*"We're very satisfied with the Ozonation System. The equipment operates perfectly. An A+ to Ozone Technology!"*

*— Tommy Carswell,  
Manager of Operations,  
Four Way WSC*

### BENEFITS

#### The Pressureless Ozonation System at Four Way WSC:

- Eliminates unpleasant color
- Reduces TTHM, ensuring compliance with the Stage 1 Disinfection Byproduct Rule
- Reduces chlorine usage
- Enhances safety
- Increases dependability
- Reduces maintenance
- Lowers water treatment and personnel costs

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### TECHNICAL INFORMATION

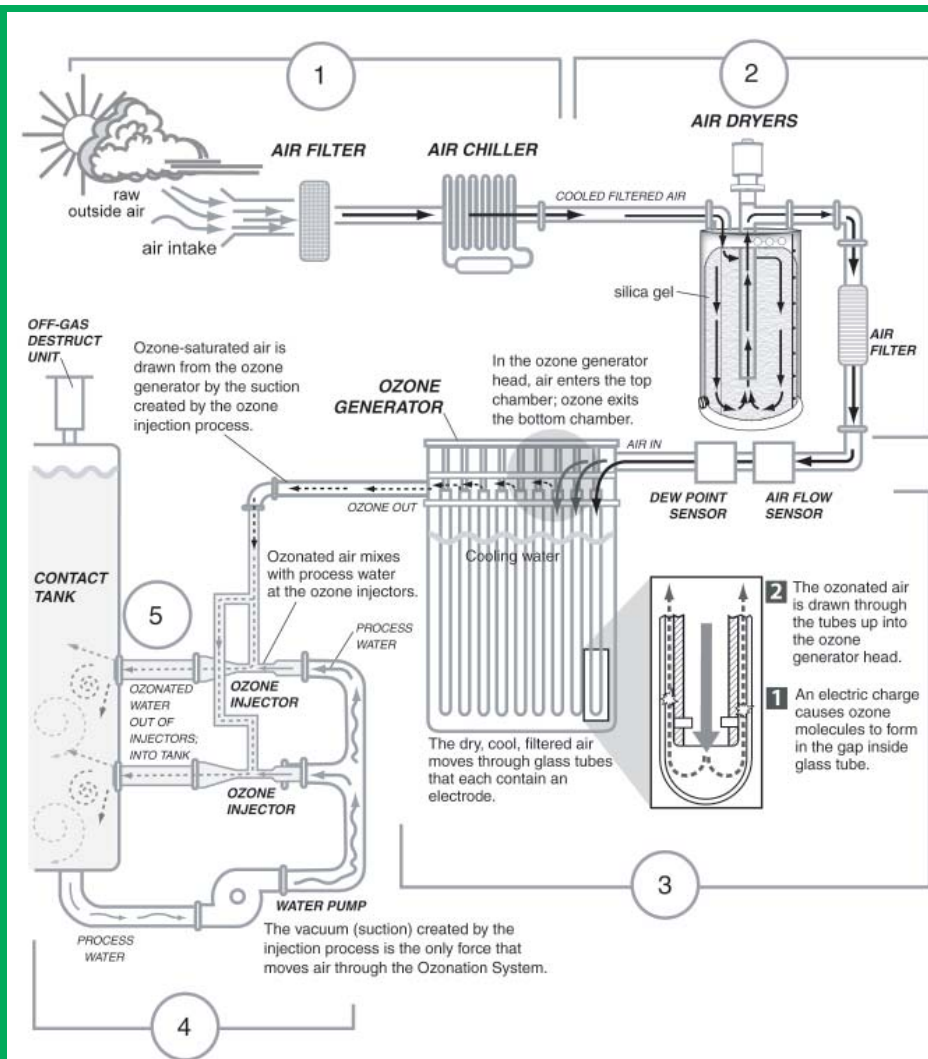
Outdoor source air is filtered and cooled. The air is then dehumidified in air dryers by means of absorptive media to a dew point of  $-40^{\circ}\text{F}$ .

The dry, processed air is drawn into an ozone generator, where it passes through electrical corona-discharge fields, causing ambient oxygen to be ionized. Lone oxygen radicals produced within the corona-discharge fields bind to gaseous diatomic oxygen to form high-energy ozone molecules. The ozone/gas mixture is typically 1.5 to 2% ozone by weight.

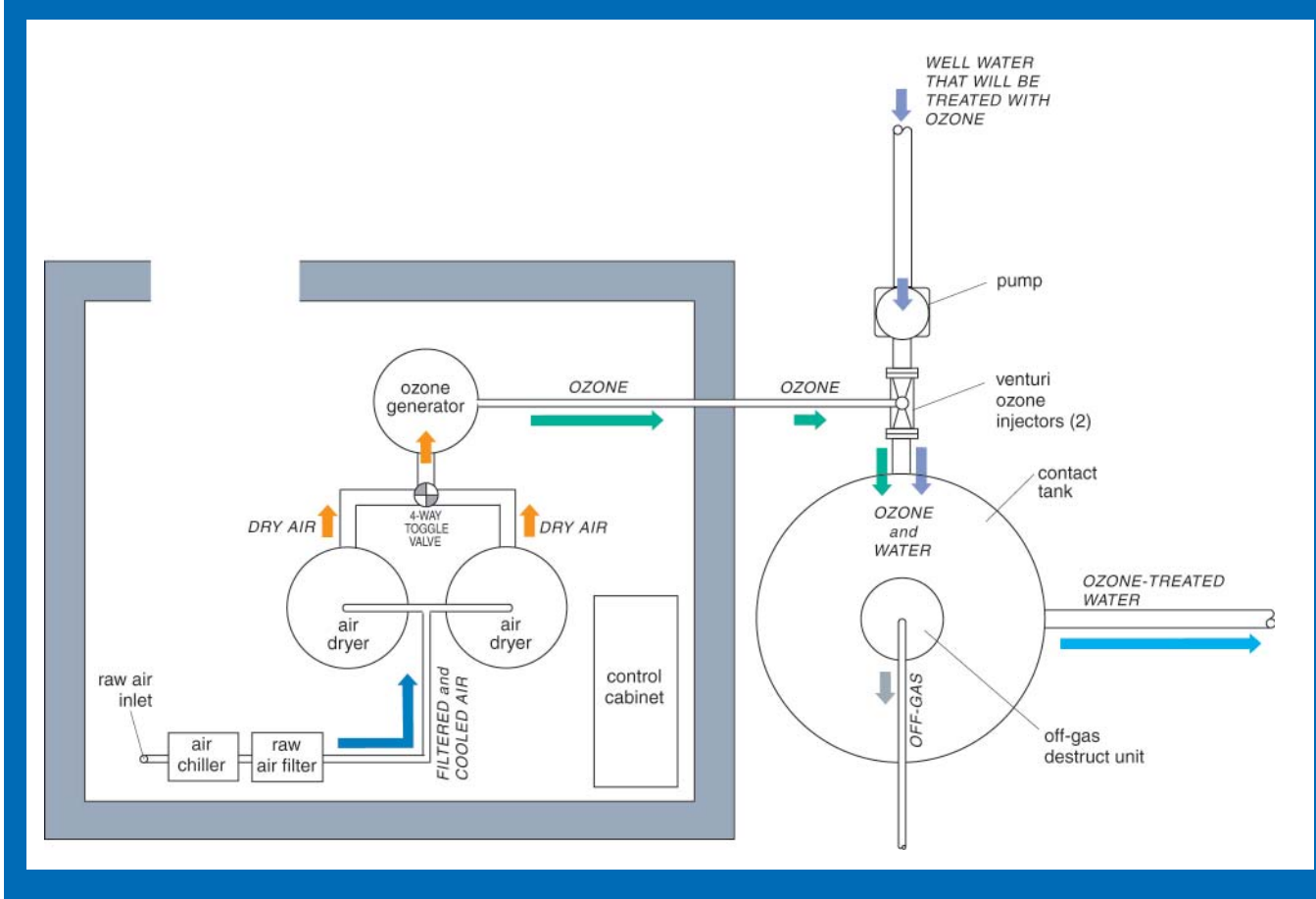
As the ozone/gas mixture bubbles throughout the water column inside the contact tank, ozone discharges its additional high-energy oxygen radical, thereby oxidizing impurities and deactivating any resident bacteria and viruses.

Any unreacted residual ozone has a very short half-life, and readily devolves back into oxygen. An ozone off-gas destruct unit converts any undissolved ozone to oxygen and discharges it to the outside air.

Suction from pump-driven venturi ozone injectors pulls the ozone from the generator and mixes it with well water in a stainless steel contact tank. Because the suction (vacuum) created by the venturi injectors is the only force that moves the air/ozone gas through the entire Ozonation System, the facility does not experience the critical gas leaks typically experienced with pressurized chemical treatment systems. Ozone Technology's pressureless, vacuum-based process achieves efficient and safe ozone gas diffusion into the water.



**Plan View–Simplified Diagram  
Model N-350 Ozonation System Installation  
Four Way WSC, Huntington, Texas**



## Ozonation System Installation

### Four Way WSC

### Huntington, Texas

#### TECHNICAL SPECIFICATIONS

##### General system specifications

|                                       |                               |
|---------------------------------------|-------------------------------|
| Ozone produced                        | 18 pounds per day (350 gr/hr) |
| Total flow rate                       | 160 gpm                       |
| Ozone treatment side-stream flow rate | 215 gpm                       |
| Ozonation contact tank size           | 2,620 gallons                 |
| Ozonation and off-gas destruct time   | 15 minutes                    |

##### Ozone Generation subsystem specifications

|   |                                     |
|---|-------------------------------------|
| Number of ozone generators                            | 1                                   |
| Ozone output  | 350 gr/hr                           |
| Ozone concentration                                   | 2%                                  |
| Gas flow to ozone generator (at full output)          | 12.25 cfm (20.1 m <sup>3</sup> /hr) |
| Cooling water required (at full output)               | 3.1 gpm (11.6 lpm)                  |
| Cooling water temperature at inlet to ozone generator | 70°F (21.1°C) nominal               |
| Supply voltage  | 460 (480) VAC, 3-phase, 60 Hz       |
| Control voltages                                      | 24 VDC and 120 VAC                  |
| High voltage  | 10,800 VAC maximum                  |
| Number of high voltage electrodes in ozone generator  | 234                                 |

##### Air Preparation subsystem specifications

|  |  |
|--|--|
| Number of air dryers                         | 2  |
| Dryer type                                   | Non-pressurized absorptive desiccant (negative pressure)         |
| Air drying capability                        | -40°F dew point or better  |
| Desiccant type                               | Granular silica gel  |
| Dryer operation cycle time (between changes) | Equivalent of 36 hours operation at full output (7 days maximum) |
| Dryer regeneration time                      | 3.5 hours nominal (8 hours maximum)                              |
| Dryer heater power                           | 6 kW   |
| Regeneration air inlet temperature           | Room ambient   |
| Regeneration air outlet temperature          | 230°F at regeneration heating cycle termination                  |

##### Ozone Injection subsystem specifications

|  |   |
|--|---|
| Ozone injectors (from ozone generator control cabinet) | 2 injectors driven by a single 15 hp pump |
|--|---|

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*Before and after: Four Way WSC water before ozonation, left; and after, right*