## IV. CONCLUSIONS AND RECOMMENDATIONS:

The Department finds that the sources of supply, treatment works, and operation as described in this report are capable of producing a safe, wholesome, and potable water supply. The quality of the water served and the City's facilities and operations adequately meet the Department's Standards. Issuance of an amended domestic water supply permit by the Department to the City is recommended subject to the following provisions:

### DEFINITIONS

| | |
|---|---|
| Operable Unit (OU) | A focused study area that allows the USEPA to take action in that area as part of an overall, basinwide site cleanup. Each San Fernando Valley OU has a selected interim remedy that will be incorporated into the final basinwide remedy. |
| North Operable Unit (NOU) | A portion of the San Fernando Valley in the northwestern portion of the City which has been identified by the USEPA as requiring remediation of groundwater contamination. |
| South Operable Unit (SOU) | A portion of the City, south of the NOU, along the east bank of the Los Angeles River. |
| Glendale Operable Unit (GOU) | This is the combination of the NOU and the SOU. It can also refer to the associated groundwater monitoring, extraction and treatment equipment. |
| Glendale Water Treatment Plant (GWTP) | The groundwater treatment facility at 800 Flower Street in Glendale, paid for by the GRG, consisting of PTAs, LPGAC and VPGAC and sodium hypochlorite and polyphosphate addition. It will be operated by the City's Water Division. |
| GOU Facilities | The extraction wells, transmission pipelines, GWTP and Grandview Pumping Station. |
| Grandview Pumping Station (GVPS) | Two (2) 1.25 million gallon covered basins and pumping facilities formerly used by the City of Glendale for storage of the waters produced by the Grandview wells. The City has refurbished the GVPS and added facilities to feed ammonia into the treated water received from the GWTP to form a |

| | |
|---|---|
| | chloramine residual. To control inorganic chemicals, the GVPS includes facilities for mixing the chloraminated water with blending water supplied from an MWD connection. |
| Point of Introduction into the System | A point downstream of the GVPS and the blending point, prior to the treated water reaching the first customer. |

## GENERAL PROVISIONS

1. The City shall comply with all state laws applicable to public water systems and any regulations and standards adopted thereunder.
2. No sources shall be added to and no changes, modifications or additions in the treatment processes listed in Provision 15 shall be made without first receiving an amended domestic water permit from this Department.
3. All personnel who operate the GWTP and GVPS treatment facilities shall be certified in accordance with Title 17, Section 7107, California Code of Regulations. The GWTP shall be operated by a Grade 3 or higher operator and the GVPS shall be operated by a Grade 2 or higher operator. Both the GWTP and the GVPS shall have 24 hour per day on-call supervision by a Grade 3 or higher operator.
4. All plant operators and supervisory personnel involved with the operation or oversight of the GWTP or the GVPS shall have a copy of and shall be familiar with the conditions of this permit amendment. A copy of the conditions shall be maintained at both facilities for reference.
5. The City shall minimize vandalism and unauthorized entry to the extraction well sites, the GWTP and the GVPS facilities at all times.
6. The City shall comply with Title 17 of the California Code of Regulations (CCR), to prevent the water system and treatment facilities from being contaminated from possible cross-connections. The City shall maintain a program for the protection of the domestic water system against backflow from premises having dual or unsafe water systems in accordance with Title 17. All backflow prevention devices shall be tested annually.

## WATER QUALITY

7. Unless listed below, water leaving the GWTP and transferred to the GVPS shall comply with all Maximum Contaminant Levels (MCLs) and Action Levels (ALs) established by this Department all times.

   Metals and constituents including the following are not expected to be removed by the GWTP. If necessary, metals and constituents including following constituents shall be controlled by blending at the GVPS to achieve the specified levels:

| | |
|---|---|
| Nitrate, as $NO_3$ | 45 mg/L, MCL |
| Aluminum | 1.0 mg/L, MCL |
| Antimony | 0.006 mg/L, MCL |
| Cadmium | 0.005 mg/L, MCL |
| Chromium | 0.050 mg/L, MCL |
| Lead | 0.015 mg/L, AL |
| Nickel | 0.10 mg/L, MCL |
| Perchlorate | 0.018 mg/L, AL |
| 1,4-Dioxane | 0.003 mg/L, AL |

8. In the event that any non-treatable constituent is present at the GWTP influent at a concentration exceeding ten (10) times than its MCL or AL based on chronic health effects or exceeding three (3) times its MCL or AL based on acute health effects, the constituent cannot be treated by blending alone. Additional treatment to include removal shall be provided.

9. The GWTP shall be operated in a manner which optimizes the removal efficiency of the organic compounds which are amenable to PTA and LPGAC treatment, with the goal of reducing these constituents to less than detectable concentrations in the finished water. If any organic compounds are detected in the finished water, the additive effects of multiple organic contaminants shall be considered. The following equation must be met by the GWTP effluent, when it can be accomplished in a cost effective manner:

$$\text{Hazard Index} = \sum_{i=1}^{n} \left\{ \frac{\text{Contaminant Concentration}}{\text{MCL or AL}} \right\}_i \leq 1$$

MCL = Maximum Contaminant Level (State Drinking Water Standard);
AL = Action Level

If the Hazard Index cannot be met, then the City shall notify this Department on the same day, unless the Department's office is closed, in which case, notification shall be made by 8:15 a.m. on the next day. Information on the extraction wells and the GWTP shall be provided to the Department.

10. The Hazard Index shall be calculated each time the GWTP effluent water is sampled for organic constituents. All calculations shall be submitted to this Department by the 10th day of the following month.

11. Constituents found in the GWTP effluent which do not have MCLs or ALs such as chlorate and vanadium shall be blended at the GVPS in a manner which optimizes the reduction of the concentration of such constituents towards levels found in the blend water utilized by the City.

12. All water supplied by the City at the Point of Introduction into the System for domestic purposes shall meet all MCLs and ALs established by the Department. If

the water quality does not comply with the California Drinking Water Standards, the City shall not use the GWTP effluent until the cause of the exceedance is remedied or additional treatment is provided to meet standards.

## EXTRACTION WELLS

13. In addition to the sources approved in the permit issued to the City of Glendale on March 25, 1999, the following new sources are approved for use as domestic sources of supply:

- Four (4) new extraction wells drilled generally in a line running northeasterly within the driveway of the DreamWorks parking structure, Grandview Avenue to a point east of Grand Central Avenue in the area known as the Glendale NOU:

| Well | Primary Station Code | Depth, (feet) | Average Capacity* (gpm) | Status |
|---|---|---|---|---|
| GN-1 | G19/043-GWGN1 | 210 | 565 | Active |
| GN-2 | G19/043-GWGN2 | 210 | 565 | Active |
| GN-3 | G19/043-GWGN3 | 200 | 565 | Active |
| GN-4 | G19/043-GWGN4 | 400 | 1,600 | Active |

*Capacity may vary up to 700 gpm for GN-1, GN-2 and GN-3, and up to 1,700 gpm for GN-4.

- Three (3) new extraction wells drilled generally in a line running east to west along Goodwin Avenue from San Fernando Road to a point within the Los Angeles Parks and Recreation yard, approximately 500 feet east of the Los Angeles River in the area known as the Glendale South Operating Unit:

| Well | Primary Station Code | Depth, (feet) | Average Capacity* (gpm) | Status |
|---|---|---|---|---|
| GS-2 | G19/043-GWGS2 | 183 | 425 | Active |
| GS-3 | G19/043-GWGS3 | 199 | 425 | Active |
| GS-4 | G19/043-GWGS4 | 198 | 425 | Active |

*Capacity may vary up to 600 gpm for GS-2, GS-3 and GS-4.

- In addition, the City currently utilizes the following sources and connections:

| Source | Primary Station Code | Status |
|---|---|---|

| | | |
|---|---|---|
| Glorietta Well No. 3 | 01/13W-10F03 S | Active |
| Glorietta Well No. 4 | 01/13W-10F01 S | Active |
| Glorietta Well No. 6 | 01/13W-10B01 S | Active |
| Verdugo Park Treatment Plant Influent (Pickup System, Wells A and B) | 1910043-019 | Active |
| MWD-G1 Connection | 1910043-021 | Active |
| MWD-G2 Connection | 1910043-022 | Active |
| MWD-G3 Connection | 1910043-023 | Active |
| Burbank, City of | Glenoaks Blvd. South of Alameda | Active and Emergency |

- The City shall provide either reverse osmosis treatment for GS-1 in order to obtain Departmental approval for use of this source as a domestic water supply or the City shall find an appropriate location to drill a new replacement well for GS-1.

14. The extraction wells shall be operated according to the Operation and Maintenance (O and M) Manual or its replacement or amendment. The replacement document or amendments shall be approved by this Department.

**GOU WATER TREATMENT FACILITIES**

15. The only treatment facilities approved for use for the treatment of extraction wells listed in Provision No. 13 by the City are:

| ***Treatment Facility*** | ***Treatment Processes*** |
|---|---|
| GWTP | • Polyphosphate addition for scale control as necessary<br>• Air stripping of volatile organic chemicals using PTAs<br>• Adsorption of organic chemicals using LPGAC<br>• Hypochlorination for disinfection |
| GVPS | • Ammonia addition for chloramination<br>• Blending of nitrates, chlorate, vanadium and other metals and other constituents with purchased water from MWD |

16. The City shall not exceed the GWTP's design capacity of 5,000 gpm at any time.

17. The City shall operate all treatment facilities listed in Provision 15. No processes shall be bypassed at anytime.

18. Recycling of condensates from the vapor phase treatment equipment or other contaminated liquids is prohibited. No backwash or other waters from the backwash or any utility tank shall be recycled back to the PTAs or the LPGAC adsorbers.

19. The PTAs and the VPGACs for treating the air from the packed tower aerators must be operated in compliance with the substantive requirements of the South Coast Air Quality Management District. Failure to so operate this equipment shall render this permit amendment null and void.

20. The City shall operate the treatment plant in accordance with the O and M Manual or its approved replacement or revision.

## PACKED TOWER AERATORS (PTAs)

21. Each PTA shall not exceed its capacity of 2,500 gallons per minute at any time.

22. Each PTA shall be operated with an air/water ratio of at least 30.4 to 1 on a volumetric basis.

23. A polyphosphate scale inhibitor shall be added to the raw water as necessary to control the buildup of mineral scale within the PTAs and LPGAC vessels. This additive must be approved in accordance with Provision 73.

## LIQUID PHASE GRANULAR ACTIVATED CARBON (LPGAC) ADSORBERS

24. Except as provided for below, each of the eight (8) LPGAC vessels shall be operated at a flowrate of no more than 625 GPM. When a vessel is removed from service for carbon changeout or any other reason, the total plant influent rate shall be adjusted so that each of the remaining LPGAC vessels receives no more than 625 gpm. Each LPGAC vessel shall be operated with an Empty Bed Contact Time (EBCT) of at least 8.6 minutes at all times.

    If the City wishes to maintain the 5,000 gpm plant flow rate with one (1) LPGAC vessel out of service, the City shall submit an operation plan for review and approval. This plan shall include:

    a. Details on staggering the carbon bed changeouts such that if a bed is removed from service the remaining seven (7) beds shall not be close to exhaustion or quickly trigger additional changeouts.

    b. Include additional monitoring of the beds remaining in service while one is out of service.

    c. Include operational experience at this facility such as the monitoring results from ¼, ½, and ¾ ports.

    d. Include a demonstration that the water quality of the remaining seven (7) beds does not deteriorate.

e. Include coordination with the LPGAC supplier so that the time of operation with seven (7) beds is limited to the time required for the physical, onsite carbon changeout and the backwashing of fines.

25. All initial and replacement carbon for the LPGAC adsorbers shall be virgin carbon and meet the requirements in the specifications of the Final Design Report, September 1996, Section 13410, as a minimum. Any change of the carbon specification shall be approved in writing by the Department.

26. Fresh charges of activated carbon shall be backwashed to remove carbon fines and the adsorber shall not discharge to the plant effluent until it is verified that no visible carbon fines are present in the adsorber's effluent.

27. Each time a carbon vessel is emptied, the vessel internals shall be inspected for evidence of damage, looseness, clogging or other problems. The condition of the lining shall be noted. Records of maintenance inspections shall be kept on file at the GWTP as specified in Provision 78.

    If entry into the vessel is necessary, the vessel shall be disinfected with a free chlorine solution of 50 mg/L and held for two (2) hours. The vessel shall be flushed to a residual of less than 0.1 mg/L prior to installing the fresh carbon.

## GRANDVIEW PUMPING STATION AND BLENDING FACILITY

28. The blending and disinfection operations at the GVPS facilities shall be conducted in accordance with this permit and the "Operational and Maintenance Manual and the Operational Sampling and Analysis Plan/Quality Assurance Project Plan for the IRA – Glendale OU Downstream Facilities" or any subsequently approved versions of these documents.

29. The operation of the GVPS shall be coordinated with the operation of the GWTP, and with the operation of the extraction wells. The operator of the GWTP plant will report daily to the GVPS operator as to which extraction wells are being utilized, and shall report any change of the source wells immediately to the GVPS.

30. If the nitrate level of the blended effluent at sample location Primary Station Code G19/043-FW86 exceeds 36 mg/L, immediate actions shall be taken to reduce the nitrate concentration.

31. The chloramine residual shall be compatible with that in the blend water obtained from the MWD. The disinfectant residual concentration in the GVPS effluent shall be within 0.5 mg/L of that in the MWD blend water.

## MONITORING

## GENERAL

32. All water quality monitoring results obtained at a certified laboratory shall be submitted to the Department using Electronic Data Transfer (EDT) utilizing the Primary Station (PS) Codes in Provision 33.

33. The following PS codes shall be utilized for transmittal of water quality data:

**Table 4**

| COMMON NAME | PRIMARY STATION CODE | WQI SOURCE NO. | DESCRIPTION |
|---|---|---|---|
| GN-1 | G19/043-GWGN1 | 025 | GOU GN-1 DISCHARGE |
| GN-2 | G19/043-GWGN2 | 026 | GOU GN-2 DISCHARGE |
| GN-3 | G19/043-GWGN3 | 027 | GOU GN-3 DISCHARGE |
| GN-4 | G19/043-GWGN4 | 028 | GOU GN-4 DISCHARGE |
| GS-1 | G19/043-GWGS1 | 029 | GOU GS-1 DISCHARGE |
| GS-2 | G19/043-GWGS2 | 030 | GOU GS-2 DISCHARGE |
| GS-3 | G19/043-GWGS3 | 031 | GOU GS-3 DISCHARGE |
| GS-4 | G19/043-GWGS4 | 032 | GOU GS-4 DISCHARGE |
| | G19/043-ITW14 | 024 | GOU PTA-1 EFFLUENT |
| | G19/043-ITW13 | 033 | GOU PTA-2 EFFLUENT |
| | G19/043-RW11 | 034 | GOU RAW WATER TO PTA-1 |
| | G19/043-RW12 | 035 | GOU RAW WATER TO PTA-2 |
| | G19/043-ITW60 | 036 | GOU VL-1, ¼ PORT |
| | G19/043-ITW61 | 037 | GOU VL-1, ½ PORT |
| | G19/043-ITW62 | 038 | GOU VL-1, ¾ PORT |
| | G19/043-TW42 | 039 | GOU TREATED WATER VL-1 |
| | G19/043-ITW43 | 040 | GOU INTERMEDIATE TW TO LPGAC |
| | G19/043-ITW63 | 041 | GOU VL-2, ¼ PORT |
| | G19/043-ITW64 | 042 | GOU VL-2, ½ PORT |
| | G19/043-ITW65 | 043 | GOU VL-2, ¾ PORT |
| | G19/043-TW44 | 044 | GOU TREATED WATER VL-2 |
| | G19/043-ITW66 | 045 | GOU VL-3, ¼ PORT |
| | G19/043-ITW67 | 046 | GOU VL-3, ½ PORT |
| | G19/043-ITW68 | 047 | GOU VL-3, ¾ PORT |
| | G19/043-TW46 | 048 | GOU TREATED WATER VL-3 |
| | G19/043-ITW69 | 049 | GOU VL-4, ¼ PORT |
| | G19/043-ITW70 | 050 | GOU VL-4, ½ PORT |
| | G19/043-ITW71 | 051 | GOU VL-4, ¾ PORT |
| | G19/043-TW48 | 052 | GOU TREATED WATER VL-4 |
| | G19/043-ITW72 | 053 | GOU VL-5, ¼ PORT |
| | G19/043-ITW73 | 054 | GOU VL-5, ½ PORT |
| | G19/043-ITW74 | 055 | GOU VL-5, ¾ PORT |
| | G19/043-TW50 | 056 | GOU TREATED WATER VL-5 |
| | G19/043-ITW75 | 057 | GOU VL-6, ¼ PORT |
| | G19/043-ITW76 | 058 | GOU VL-6, ½ PORT |

| | | | |
|---|---|---|---|
| | G19/043-ITW77 | 059 | GOU VL-6, ¾ PORT |
| | G19/043-TW52 | 060 | GOU TREATED WATER VL-6 |
| | G19/043-ITW78 | 061 | GOU VL-7, ¼ PORT |
| | G19/043-ITW79 | 062 | GOU VL-7, ½ PORT |
| | G19/043-ITW80 | 063 | GOU VL-7, ¾ PORT |
| | G19/043-TW54 | 064 | GOU TREATED WATER VL-7 |
| | G19/043-ITW81 | 065 | GOU VL-8, ¼ PORT |
| | G19/043-ITW82 | 066 | GOU VL-8, ½ PORT |
| | G19/043-ITW80 | 067 | GOU VL-8, ¾ PORT |
| | G19/043-TW56 | 068 | GOU TREATED WATER VL-8 |
| Treated Water | G19/043-TW58 | 069 | TW BEFORE DISINFECTION |
| Finished Water | G19/043-TW59 | 070 | FINISHED WATER, DISINFECTED |
| | G19/043-RW39 | 071 | COMBINED SOU RAW WATER @AIR/VAC VALVE |
| | G19/043-RW39 | 072 | COMBINED NOU RAW WATER @ WTP |
| | G19/043-ITW84 | 073 | INTERMED. TREATED WATER @ LPGAC HEADER |
| | G19/043-FW85 | 074 | INFLUENT TO GRANDVIEW PUMP STATION |
| | G19/043-FW86 | 075 | BLENDED EFFLUENT FROM GRANDVIEW PUMP STATION (POINT OF INTRODUCTION INTO THE SYSTEM) |

34. Water samples for operational control purposes may be analyzed by field test kits, continuous monitors or benchtop units within the GWTP and GVPS. All water samples for compliance purposes shall be analyzed at a laboratory certified by the Department's Environmental Laboratory Accreditation Program (ELAP) for each analytical technique. If no certification is available for a particular compound, the method and detection limit shall be submitted for approval by the Department on a case by case basis.

35. Analysis for synthetic organic chemicals (SOCs), base, neutral, and acid extractable organic chemicals (BNAs), VOCs, chromium, nitrate, Methyl *tert* butyl ether (MTBE), and 1,2,3-trichloropropane (1,2,3-TCP) shall employ EPA methods, Standard Methods for the Examination of Water and Wastewater or other drinking water methods certified by ELAP as follows. If samples need to be diluted for analyses, then an undiluted sample shall also be run to assure all analytes are reported at the lowest possible reporting limits.

    The laboratory shall report full results of all analyses performed.

**Table 5**

| Chemical | Analytical Methods |
|---|---|
| SOCs | EPA Method (If any unknown peak show on chromatographs, it shall be reported to this Department) |
| Alachlor | 505 ,507 ,525.2 ,508.1 |
| Aldicarb | 531.1 |
| Aldicarb Sulfone | 531.1 |
| Aldicarb Sulfoxide | 531.1 |
| Atrazine | 505 ,507 ,525.2 ,508.1 |
| Bentazon | 515.1 |
| SOCs | EPA Method |
| Benzo (a) pyrene | 525.2 ,550 ,550.1 |
| Carbofuran | 531.1 , 6610 |
| Chlordane | 505 ,508 ,525.2 ,508.1 |
| 2,4-D | 515.2 ,555 ,515.1 |
| Dalapon | 515.2 ,515.1 |
| Di (2-ethylhexyl) adipate | 506 ,525.2 |
| Di (2-ethylhexyl) phthalate | 506 ,525.2 |
| DBCP | 504.1 ,551 |
| Dinoseb | 515.2 |
| Diquat | 549.1 |
| Endothall | 548.1 |
| Endrin | 505 ,508 ,525.2 ,508.1 |
| Ethylene Dibromide (EDB) | 504.1 ,551 |
| Glyphosate | 547 ,6651 |
| Heptachlor | 505 ,508 ,525.2 ,508.1 |
| Heptachlor Epoxide | 505 ,508 ,525.2 ,508.1 |
| Hexachlorobenzene | 505 ,508 ,525.2 ,508.1 |
| Hexachlorocyclopentadiene | 505 ,508 ,525.2 ,508.1 |
| Lindane | 505 ,508 ,525.2 ,508.1 |
| Methoxychlor | 505 ,508 ,525.2 ,508.1 |
| Molinate | 507 |
| Oxamyl (Vydate) | 531.1 ,6610 |
| Pentachlorophenol | 515.2 ,525.2 ,555 ,515.1 |
| Picloram | 515.2 ,555 ,515.1 |
| PCBs | 508A |
| Simazine | 505 ,507 ,525.2 ,508.1 |
| Thiobencarb | 507 |
| Toxaphene | 505 ,508 ,525.2 |
| 2,3,7,8-TCDD (Dioxin) | 1613 ,513 |

| | |
|---|---|
| 2,4,5-TP (Silvex) | 515.2 ,555 ,515.1 |
| Bromacil | 507 |
| Chlorothalonil | 508 |
| Diazinon | 507 |
| Dimethoate | 507 |
| Diuron | 632 |
| Naphthalene | 525.2 |
| Phthalates | 506 ,525.2 |
| Prometryn | 507 |
| 2,4,5-T | 515.1 |
| Aldrin | 505 ,508 ,525.2 |
| Butachlor | 507 ,525.2 |
| Carbaryl | 531.1 |
| Dicamba | 515.1 |
| Dieldrin | 505 ,508 ,525.2 |
| 3-Hydroxycarbofuran | 531.1 |
| Methomyl | 531.1 |
| Metolachlor | 507 , 525.2 |
| Metribuzin | 507 ,508 ,525.2 |
| Propachlor | 507 ,525.2 |
| BNAs, 1,4-Dioxane | EPA Method 8270, 525.2 (If any unknown peak show on chromatographs, it shall be identified and reported to this Department) |
| VOCs | EPA Method 524.2 or 502.2 (If any unknown peak show on chromatographs, it shall be confirmed by method 524.2, identified, and reported to this Department) |
| Metals | EPA Method 200.7, 200.8 or 200.9, Standard Method 3113 B Mercury also by Method 245.1 or 245.2 |
| Nitrate | EPA Method 300.0 or 353.2; or Standard Method 4500-$NO_3$F, 4500-$NO_3$E, 4500-$NO_3$D or 4110 |
| MTBE, TAME, ETBE | EPA method 524.2 or 502.2 |
| 1,2,3-TCP | EPA method 524.2 or 504.1 |
| SOCs | EPA Method (If any unknown peak shown on chromatographs, it shall be reported to this Department) |
| Chlorate | EPA method 300.1 |
| 1,2,3-TCP | EPA method 524.2 or 504.1 |
| Perchlorate | EPA method 300.0 –IC or 314 |

36. Sampling shall be performed in a manner which minimizes the chances for contamination of the sample. Sampling events shall be planned so that the cleaner samples (plant effluent, individual carbon adsorber effluent, and intermediate water) are sampled prior to taking influent samples. Alternatively, a different individual may be designated to take plant influent samples.

37. All known and unknown peaks on the chromatographs shall be reported. The laboratory performing the analyses shall be instructed to report these peaks. All

unknown peaks shown on GC-MS spectra of the analysis of the GWTP effluent shall be tentatively identified and reported to this Department within seven (7) days of such determination. The Department may require that such peaks shall be positively identified within 30 days of the tentative determination. This Department shall be notified in writing within seven (7) days of the positive identification. If necessary, the Department may extend these determination times upon request.

38. The City shall comply with any additional conditions which the Department deems necessary based on any newly identified constituents.

39. Where specified, low level analysis for 1,2,3-trichloropropane (1,2,3-TCP) shall be performed by an ELAP certified laboratory with the lowest achievable reporting limit or 2 parts per trillion (ppt). On a yearly basis, laboratories shall be evaluated to determine which laboratory can achieve the lowest reporting limit or 2 ppt. At this time, a reporting limit of 50 ppt or lower shall be achieved.

40. Where specified, analysis for N-nitrosodimethylamine (NDMA) shall be performed by an ELAP certified laboratory with the lowest achievable reporting limit or 2 ppt.

41. If necessary, the Department may modify the monitoring provisions specified herein based on additional information. The City may request a modification of any monitoring provision based upon substantiating data.

**EARLY WARNING MONITORING WELLS**

42. The following monitoring wells owned by the USEPA shall be sampled and analyzed in order to provide early detection of any new constituents or significant changes of previously identified constituents that may effect the extraction wells:

| MONITORING WELL | PRIMARY STATION CODE | WQI SOURCE NO. |
|---|---|---|
| CS-C03-100 | To be assigned | To be assigned |
| CS-VPB-04 | To be assigned | To be assigned |
| CS- VPB-08 | To be assigned | To be assigned |
| CS-VPB-06 | To be assigned | To be assigned |
| CS-VPB-10 | To be assigned | To be assigned |

Sampling shall be performed at the time that the USEPA or its contractor collects samples from these wells.

If these wells become unavailable, then the City shall drill replacement monitoring wells and continue the same monitoring program.

43. Samples from these wells shall be analyzed annually by the City for:

- All organic constituents in the Vulnerability Assessment Guideline (Appendix G). Add any constituents from 624/625 analyte lists not included on the 524.2/525.2 lists. Report all detections and peaks as required in Provision 37.

- BNA semi-volatile organic chemicals, including 1-4 dioxane. Report all detections and peaks as required in Provision 37.

- Low level 1,2,3-TCP.

- Perchlorate and chlorate

- Complete metals analysis

## EXTRACTION WELL (SOURCE) MONITORING

44. Each extraction well shall be sampled, at a minimum, in accordance with the attached Vulnerability Assessment and Monitoring Frequency Guidelines Appendix G or its replacement prepared by this Department. Previous analytical results may be used to comply with the monitoring requirements, and shall be submitted to this Department for review, when requesting a waiver. A summary of the monthly sampling results for detected organic compounds, chromium and other metals, nitrite, and nitrate in all extraction wells shall be submitted to this Department by the 20$^{th}$ day of the following month (see Provision No. 76).

    In addition, each extraction well shall be analyzed for BNAs including 1-4 dioxane at least annually.

45. In addition to the metals included in the Vulnerability Assessment and Monitoring Frequency Guidelines required in Provision 44, a full scan for metals (such as Inductively Coupled Plasma/Mass Spectroscopy, ICP/MS) including vanadium shall be performed monthly. Each extraction well shall be analyzed monthly for chlorate.

46. Low level analysis for 1,2,3-TCP shall be performed annually for each extraction well, unless this compound is are detected in any of the early warning monitoring wells or the extraction wells, in which case the low level analysis for these compounds shall be performed monthly.

## SPECIAL MONITORING FOR WELL GS-4

47. Well No. GS-4 shall be monitored quarterly for total petroleum hydrocarbons in the water using an EPA approved method. A plan for installing vapor probes around this well shall be submitted for review and approval prior to the installation of the probes. After installation of the vapor probes, they shall be tested quarterly for total hydrocarbon gases using a portable flame ionization detector. The survey results shall be included with the monthly report.

## GWTP INFLUENT MONITORING

48. The raw water entering the GWTP (combined influent, PS code G19/043-RW11) shall be sampled biweekly during the first year of operation for VOCs to monitor and

evaluate the removal efficiency and variability. After the first year, the monitoring may be decreased to monthly, based upon approval from this Department. A secondary sampling point, PS code G19/043-RW12, which is also representative of the combined plant influent, shall be utilized only if PTA-1 is out of service.

**PTA EFFLUENT MONITORING**

49. The effluent from each PTA (PS codes G19/043-ITW14 and G19/043-ITW13) shall be sampled biweekly during the first year of operation for VOCs to monitor and evaluate the removal efficiency and variability. Ambient air temperature shall also be noted at the time of sampling. After the first year, the monitoring may be decreased to monthly, based upon approval from this Department

50. The removal efficiency for TCE shall be plotted on a control chart along with the ambient temperature. If 1,2-DCA is present in the influent water, its removal efficiency shall also be calculated and plotted. The Department may require that the removal efficiency of additional compounds be plotted.

51. The combined effluent from the PTAs (PS code G19/043-ITW84) shall be tested quarterly for BNAs including 1,4-dioxane and low level 1,2,3-TCP. The frequency shall be respective analysis shall be performed monthly if any BNA or 1,2,3-TCP are detected in the monitoring wells, extraction wells or PTA effluent.

**LPGAC MONITORING**

52. Each LPGAC vessel shall be monitored as follows:

- When the carbon bed is fresh, sampling for organics shall be performed monthly at the ¼ port. Upon detection of any adsorbable organic constituent, a sample at the ½ port shall be taken and analyzed within 48 hours. Non-adsorbable compounds, if detected, such as 1,4-dioxane shall be controlled by blending or other treatment, if necessary. If 1,2,3-TCP is detected in the monitoring wells, extraction wells, or PTA effluent, testing of low level 1,2,3 TCP shall be included in the LPGAC testing.

- Sampling shall continue monthly at the ½ port until such time that any adsorbable organic constituent is detected. Upon detection of any organic constituent, a sample at the ¾ port shall be taken and analyzed within 48 hours.

- Sampling shall then continue weekly at the ¾ port, until any adsorbable organic constituent is detected. When any adsorbable organic constituent is detected at the ¾ port the laboratory shall be instructed to immediately notify the City, and the vessel effluent shall be sampled within 24 hours of the detection and analyzed within 48 hours of sampling. If any adsorbable constituent is above the DLR or specified detection limit in the effluent sample, the vessel shall be immediately removed from service. If no adsorbable organics are detected in the effluent sample, the vessel may continue in service, but the effluent shall be tested weekly and the City shall arrange to change the carbon bed before there is a detection in the effluent.

53. The Department may reduce the LPGAC sampling protocols based on changes in the groundwater concentration, actual plant performance data, and analytical capabilities.

54. If any LPGAC bed is backflushed and returned to normal downflow, the effluent from that vessel shall be run to waste or to the backwash tank. An effluent sample from that vessel shall be obtained after one (1) hour, checked for carbon fines and analyzed for adsorbable organics using methods 524.2 and 525.2. If all adsorbable organics are non-detectable, the vessel may continue in normal service.

55. Each time an LPGAC bed is replaced, the effluent from that vessel shall be analyzed daily for total suspended solids for the initial (5) five days of service to ensure that no carbon fines are present.

56. Sampling and analysis for total coliform and heterotrophic plate count (HPC) shall be conducted weekly on the combined LPGAC effluent (treated water) prior to chlorination (PS code G19/043-TW58). If any sample is positive for total coliform, the laboratory shall automatically test for fecal/E. coli.

57. If either total coliform is present or HPC exceeds 500/mL, confirming samples shall be taken at the plant effluent before chlorination, and from the effluent of each vessel, and analyzed as soon as practicable. The laboratory performing the tests shall notify the plant operator by telephone or fax as soon as results are available.

58. The City shall take the necessary steps to determine which bed(s) is responsible for the coliform problem and remove it from service and disinfect or replace the carbon, if flushing to waste does not correct the bacteriological problem.

**TREATMENT PLANT EFFLUENT**

59. Sampling and analysis for VOCs and metals shall be conducted weekly on the combined LPGAC effluent (treated water) prior to chlorination (PS code G19/043-TW58).

60. If 1,2,3-TCP is detected in the monitoring wells, extraction wells, or PTA effluent, monthly testing of low level 1,2,3 TCP in the finished water prior to chlorination (PS code G19/043-TW58) shall be performed. If 1,4-dioxane is detected in the monitoring wells, extraction wells, or PTA effluent, BNA and method 525.2 testing or the finished water prior to chlorination (PS code G19/043-TW58) shall be performed monthly.

61. Perchlorate and chlorate shall be tested for quarterly, prior to disinfection (PS code G19/043-TW58).

62. Title 22 SOCs shall be tested for quarterly in the finished water prior to chlorination (PS code G19/043-TW58) if SOCs are detected in the monitoring wells or extraction wells.

63. The Hazard Index shall be calculated and reported weekly for VOCs and monthly for all organic chemicals at PS code G19/043-TW58.

64. The finished water after disinfection shall be continuously monitored for free chlorine using Primary Station Code G19/043-TW59.

## BLENDING FACILITIES MONITORING

65. The influent water (P.S. Code G19/043-FW85) to the Grandview Basins (GVPS) shall be continuously monitored for free chlorine.

66. The concentration of nitrate in the inlet to the GVPS (PS Code G19/043-FW85) shall be checked daily with a benchtop UV spectrophotometer or ion selective electrode and the rate of MWD blend water shall be calculated and adjusted daily as needed to achieve the target of no more than 30 mg/L of nitrate as $NO_3$ in the blended water.

67. The blended water at the designated Point of Introduction to the System, (PS Code G19/043-FW86) shall be continuously monitored for monochloramine, nitrate and free ammonia and the results recorded. A weekly sample shall be analyzed for nitrate by a certified laboratory. A sample shall be analyzed by a certified laboratory monthly for chlorate, vanadium, and any other chemical requiring blending.

68. In order to comply with Provision No. 11, the City shall determine the concentration of those constituents in the blend water, which may be present in the extraction wells or GWTP effluent, which do not have MCLs or ALs. The City shall analyze for these constituents monthly in the GVPS blended water and include the findings in the monthly report to the Department.

## OPERATIONS AND MAINTENANCE

69. Except as specified in this permit, the GWTP and associated extraction wells, transmission piping and the GVPS shall be operated in accordance with the O and M Manuals For The Glendale NOU and SOU or subsequent approved revisions of these documents.

70. The status of the extraction wells shall be recorded daily, and the GWTP and GVPS shall be inspected daily for any abnormal occurrences including but not limited to leaks, unusual noises, or pressure readings. A checklist of items to be examined shall be filled out daily and maintained at the GWTP for a minimum of five (5) years.

71. Sampling ports and probes on each LPGAC vessel shall be maintained in good operating condition at the ¼, ½, and ¾ of the bed depths, and the vessel effluent.

72. All chemicals used for cleaning or disinfection of the PTAs or LPGAC beds shall be approved by the NSF or UL as meeting the NSF 60 standard for drinking water additives.

73. The polyphosphate anti-scalant shall be approved by the NSF or UL as meeting the NSF 60 standard for drinking water additives. The manufacturers recommended dosages and other instructions shall be followed. The dosage shall not exceed the concentration for which NSF approval has been obtained.

74. The hypochlorite lines feeding each of the PTAs shall be physically disconnected from the PTAs and blind-flanged. These connections shall be restored during disinfection. After disinfection of the PTAs is complete, the connection shall again be physically disconnected.

75. All water meters and analyzers, including the meter, which measures the flow rate of MWD water used at the GVPS, shall be calibrated at least as frequently as recommended by the manufacturer. Records of the calibrations shall be maintained for at least five (5) years.

## RECORDS AND REPORTING

76. A monthly report of the operation of the Glendale facilities shall be submitted to this Department, by the 20th day of the following month. As a minimum, the report shall include:

    a. the daily operation, length of time in use and production of each extraction well,

    b. a summary of all contaminants in the early warning monitoring wells, extraction wells, GWTP effluent and intermediate water detected at or above MCLs or Action Levels,

    c. copies of laboratory analysis results for GWTP influent, effluent and intermediate water,

    d. the daily amount of water processed by the GWTP, and by the GVPS,

    e. daily air/water ratio and water flowrate through the two packed tower aerators,

    f. determinations of tower removal efficiencies for TCE, PCE, 1,2-DCA and any other compound requested by the Department,

    g. the most recent graph of the removal efficiencies of the PTAs and the air to water ratios used,

    h. a report indicating the status of each LPGAC bed in terms of number of days in service, monitoring port status, what VOCs were detected and the concentration at the prior sample port, the weekly calculation of the Hazard Index, and bacterial analysis for each bed and the plant effluent prior to chlorination,

    i. the daily flowrate through each LPGAC bed,

    j. the daily polyphosphate injection rate (lbs/day or gal/day), and the daily dosage rate (mg/L),

    k. a spreadsheet showing daily blending calculations for chromium in the GWTP treated water and in the GVPS blended effluent, based on the monthly well analysis and showing weekly laboratory analysis of the GWTP treated water,

    l. the amount of chlorine and ammonia used daily,

m. daily free and total chlorine residuals at the GWTP and GVPS,

n. the daily target and actual nitrate concentration of the water entering the GVPS and leaving the blending point, and the correlation between the continuous nitrate analyzer and the laboratory confirmation sample,

o. a summary of the laboratory results and calculated ranges of other chemicals being controlled by blending at the Point of Introduction Into the System,

p. operational schedule and problems, both scheduled interruptions and any unscheduled interruption,

q. The report shall also include a summary of all required analytical results of the wells, air stripping tower influent and effluent, LPGAC effluent and blended water.

77. Any change in the monitoring and reporting requirements shall be approved by the Department in writing.

78. Copies of reports, inspections and all records shall be kept for at least five (5) years. Water quality records shall be kept for 10 years.

79. The City shall prepare annual report to the Department, which shall include compliance with the permit provisions, the treatment plants, status, condition, and performance and any problems or difficulties. This report shall be due by March 30 of the following year.

80. The City shall immediately inform the Department by telephone and fax, of any exceedance of any organic constituent's MCL or Action Level in the effluent of the GWTP. If the Department is closed at the time, it shall be notified by telephone by 8:15 a.m. of the next day. The water shall not be supplied to the distribution system until such exceedance has been corrected.

## COMPLIANCE SCHEDULE

81. Within thirty (30) days after receipt of this water system permit amendment, the City shall submit for review and approval checklists for daily inspection of the GWTP and GVPS, and a weekly inspection checklist for the extraction wells.

82. Within sixty (60) days after receipt of this water system permit amendment, the City shall submit for review and approval a proposal for the installation of vapor probes around Well GS-4. The installation of the vapor probes shall be completed within 60 days of approval of the proposal.

83. Within 90 days after receipt of this water system permit amendment, the indicator dials on the LPGAC vessel flowmeters shall be re-located to eye level.

84. After one (1) year of operation, the Operation and Maintenance Manuals for the GWTP and GVPS shall be updated based on the first year's operational experience. The Manuals shall include a daily checklist of inspected items for each facility. The manuals shall include items identified in Section 6 (Reliability Analysis) of the Policy

97-005 Guidance Submittal prepared by CDM and annual leak testing of critical valves such as the bypass valves on the PTAs. The updated manuals shall be submitted within 15 months after receipt of this water system permit amendment.

85. The Department is developing ALs for vanadium, chlorate, cobalt and isopropyl alcohol. When these ALs are adopted, they shall be met in the GVPS blended effluent, PS Code G19/043- FW86.

86. The City shall develop a cooperative agreement with the USEPA covering the monitoring wells identified in Provision 42. The agreement shall allow for the continued access and usage of these wells for monitoring. The agreement shall include a section on proper maintenance of these monitoring wells and any associated appurtenances. A copy of the agreement shall be provided to the Department within six (6) months of receipt of the amended permit.