

## Translated Logical Schema

**Area** (geoname\_id, area\_name, area\_ascii\_name, country\_code, country\_name, latitude, longitude)

**Center** (center\_id, postal\_code, house\_number, street, district)

**Monitors** (Area<sup>geoname\_id</sup>, Center<sup>center\_id</sup>)

**Operator** (user\_id, ssid, operator\_surname, operator\_name, email, password)

**Parameter** (date, time, Category<sup>category\_id</sup>, Operator<sup>user\_id</sup>, Area<sup>geoname\_id</sup>, Center<sup>center\_id</sup>, score, notes)

**Category** (category\_id, explanation)

### SQL queries to create the logical schema

```
CREATE TABLE Area (  
    geoname_id INTEGER PRIMARY KEY,  
    area_name VARCHAR(100) NOT NULL,  
    area_ascii_name VARCHAR(100) NOT NULL,  
    country_code CHAR(2) NOT NULL,  
    country_name VARCHAR(100) NOT NULL,  
    latitude DECIMAL(9,5) NOT NULL,  
    longitude DECIMAL(9,5) NOT NULL  
);
```

```
CREATE TABLE Center (  
    center_id VARCHAR(100) PRIMARY KEY,  
    city INTEGER REFERENCES Area(geoname_id)  
        ON UPDATE CASCADE  
        ON DELETE NO ACTION,  
    street VARCHAR(100) NOT NULL,  
    house_number INTEGER NOT NULL,  
    postal_code INTEGER NOT NULL,  
    district VARCHAR(100),  
    CONSTRAINT address UNIQUE(city, street, house_number),  
);
```

```
CREATE UNIQUE INDEX unique_center_id_lower ON center  
(LOWER(center_id));
```

```
CREATE TABLE Monitors(  
    center_id VARCHAR(100) REFERENCES Center  
        ON UPDATE CASCADE  
        ON DELETE NO ACTION,  
    geoname_id INTEGER REFERENCES Area  
        ON UPDATE CASCADE  
        ON DELETE NO ACTION,  
    PRIMARY KEY(center_id, geoname_id)  
);
```

```
CREATE TABLE Operator(  
    user_id VARCHAR(50) PRIMARY KEY,  
    ssid VARCHAR(16) NOT NULL,  
    operator_surname VARCHAR(50) NOT NULL,  
    operator_name VARCHAR(50) NOT NULL,  
    email VARCHAR(100) NOT NULL,  
    password VARCHAR(64) NOT NULL,  
    center_id VARCHAR(100) REFERENCES Center  
        ON UPDATE CASCADE  
        ON DELETE NO ACTION,  
    UNIQUE(ssid, email),  
    CONSTRAINT ssid_length_16 CHECK(LENGTH(ssid) = 16)  
);
```

```
CREATE TABLE Category(  
    category_id VARCHAR(20) PRIMARY KEY,  
    explanation VARCHAR(256) NOT NULL  
);
```

```
CREATE TABLE Parameter(  
    geoname_id INTEGER,  
    center_id VARCHAR(100),  
    rec_timestamp TIMESTAMP,  
    category_id VARCHAR(20) REFERENCES Category  
        ON UPDATE CASCADE  
        ON DELETE NO ACTION,  
    user_id VARCHAR(50) REFERENCES Operator  
        ON UPDATE CASCADE  
        ON DELETE NO ACTION,  
    score INTEGER NOT NULL,  
    notes VARCHAR(256) DEFAULT '',  
    FOREIGN KEY(center_id, geoname_id) REFERENCES Monitors  
        ON UPDATE CASCADE  
        ON DELETE NO ACTION,  
    PRIMARY KEY(rec_timestamp, category_id, user_id, geoname_id,  
        center_id),  
    CONSTRAINT valid_score CHECK(score BETWEEN 1 AND 5)  
);
```