

# Smart Contract Audit

**FOR** 

# PEPACOIN

DATED: 3 May 23'



## **AUDIT SUMMARY**

Project name - PEPACOIN

**Date: 3 May, 2023** 

**Scope of Audit-** Audit Ace was consulted to conduct the smart contract audit of the solidity source codes.

**Audit Status: Passed With High Risk** 

### **Issues Found**

Status	Critical	High	Medium	Low	Suggestion
Open	0	2	0	0	0
Acknowledged	0	0	0	0	0
Resolved	0	0	0	0	0



## **USED TOOLS**

### Tools:

### 1- Manual Review:

A line by line code review has been performed by audit ace team.

2- BSC Test Network: All tests were conducted on the BSC Test network, and each test has a corresponding transaction attached to it. These tests can be found in the "Functional Tests" section of the report.

### 3-Slither:

The code has undergone static analysis using Slither.

### **Testnet version:**

The tests were performed using the contract deployed on the BSC Testnet, which can be found at the following address:

https://testnet.bscscan.com/token/0x434ab6e14b1dee9bd075a94ec8770131213118d0



## **Token Information**

Token Name: PEPACOIN

Token Symbol: PEPA

Decimals: 18

Token Supply: 420,000,000,000,000

### Token Address:

0x98E039F9673F69CeC1CcA175f3458AB3ff9a0751

### Checksum:

7b0d6058387825c26af841b8913f24278a52984c

### Owner:

OxdA2D4D9F2a7C7E9F1997FE56c6F05088fb9a6C6f (at time of writing the audit)

### Deployer:

0xdA2D4D9F2a7C7E9F1997FE56c6F05088fb9a6C6f



## TOKEN OVERVIEW

Fees:

Buy Fees: up to 20%

Sell Fees: up to 20%

Transfer Fees: 0%

Fees Privilege: Owner

Ownership: Owned

Minting: No mint function

Max Tx Amount/ Max Wallet Amount: Yes

Blacklist: No

Other Privileges: updating fee - updating max tx and

wallet



## **AUDIT METHODOLOGY**

The auditing process will follow a routine as special considerations by Auditace:

- Review of the specifications, sources, and instructions provided to Auditace to make sure the contract logic meets the intentions of the client without exposing the user's funds to risk.
- Manual review of the entire codebase by our experts, which is the process of reading source code line-byline in an attempt to identify potential vulnerabilities.
- Specification comparison is the process of checking whether the code does what the specifications, sources, and instructions provided to Auditace describe.
- Test coverage analysis determines whether the test cases are covering the code and how much code isexercised when we run the test cases.
- Symbolic execution is analysing a program to determine what inputs cause each part of a program to execute.
- Reviewing the codebase to improve maintainability, security, and control based on the established industry and academic practices.



## **VULNERABILITY CHECKLIST**





## **CLASSIFICATION OF RISK**

### Severity

- Critical
- High-Risk
- Medium-Risk
- Low-Risk
- Gas Optimization/Suggestion

### **Description**

These vulnerabilities could be exploited easily and can lead to asset loss, data loss, asset, or data manipulation. They should be fixed right away.

A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.

A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.

A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.

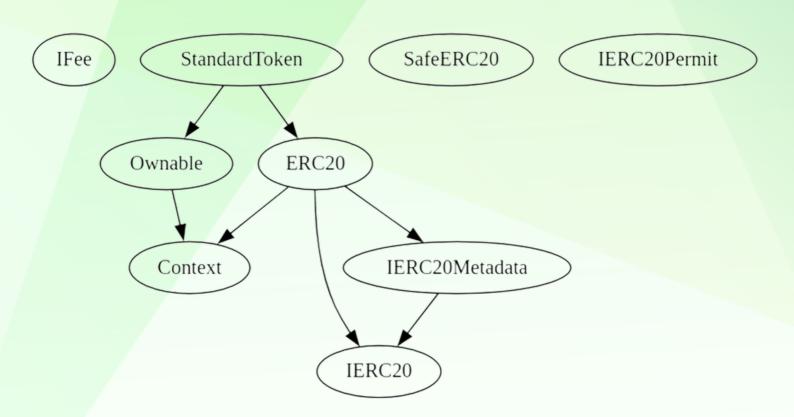
A vulnerability that has an informational character but is not affecting any of the code.

### **Findings**

Severity	Found
◆ Critical	0
♦ High-Risk	2
◆ Medium-Risk	0
♦ Low-Risk	0
<ul><li>Gas Optimization /</li><li>Suggestions</li></ul>	0



## **INHERITANCE TREE**





### **POINTS TO NOTE**

- Owner is able to set 20% for buy/sell fee separately (40% total)
- Owner is not able to set transfer tax (0% tax)
- Owner is not able to blacklist an arbitrary wallet
- Owner is not able to mint new tokens
- Owner is able to disable buy/sell/transfers by setting a max transaction and max wallet amounts to a very little number (1 wei)
- Owner is able to set a limit for max amount of buy/holding/selling, lowest amount of this limit can be 0.0000000000000000001 of PEPA tokens (1 wei)



```
Contract |
          Type
                  Bases
  | **Function Name** | **Visibility** | **Mutability** | **Modifiers** |
**IUniswapV2Router01** | Interface | |||
| factory | External | NO | | | |
| WETH | External | | NO | |
| addLiquidity | External | | | NO | |
| addLiquidityETH | External | | 1 | NO | |
removeLiquidityWithPermit | External | | | NO |
removeLiquidityETHWithPermit | External | | | NO | |
L | swapExactETHForTokens | External | | SD | NO |
| swapETHForExactTokens | External | | SD | NO |
L | quote | External | | NO | |
L | getAmountOut | External | | NO | |
L | getAmountIn | External | | NO | |
L | getAmountsOut | External | | NO | |
L | getAmountsIn | External | | NO | |
**IUniswapV2Router02** | Interface | IUniswapV2Router01 |||
L | swapExactETHForTokensSupportingFeeOnTransferTokens | External | | ■ NO | |
**IUniswapV2Pair** | Interface | |||
| L | name | External | | NO | |
L | symbol | External | | NO | |
L | decimals | External | | NO |
L | totalSupply | External | | | NO | |
L | balanceOf | External | | NO | |
L | allowance | External | | NO | |
L | approve | External | | | NO | |
L | transfer | External | | | NO | |
L | transferFrom | External | | | NO | |
L | DOMAIN SEPARATOR | External | | | NO | |
L | PERMIT TYPEHASH | External | | | NO | |
```



```
| nonces | External | NO |
 | MINIMUM LIQUIDITY | External | | | NO | |
 | factory | External | NO
 L | token0 | External | | NO | |
 L token1 | External | NO | |
 | getReserves | External | NO | | | |
 | | price0CumulativeLast | External | | NO | |
| | price1 CumulativeLast | External | | NO | |
 L|kLast|External | | NO | |
burn | External | | NO | |
 L | sync | External | | | NO | |
 **IUniswapV2Factory** | Interface | |||
L | feeTo | External | | NO | |
 L | feeToSetter | External | | NO | |
 L | getPair | External | | NO | |
 L | allPairs | External | | NO | |
 L | allPairsLength | External | | NO | |
L | createPair | External | | | NO | |
L | setFeeTo | External | | NO | |
| L | INIT CODE PAIR HASH | External | | NO | | |
| **IUniswapV2Caller** | Interface | |||
| L | swapExactTokensForTokensSupportingFeeOnTransferTokens | External | | | NO | |
| **IFee** | Interface | |||
| L | payFee | External | | 💵 |NO | |
| **StandardToken** | Implementation | ERC20, Ownable ||
L | <Constructor> | Public | | ERC20 |
 L | decimals | Public | | NO | |
 └ | updateUniswapV2Pair | External ! | ● | onlyOwner |
 L | updateUniswapV2Router | Public | | | onlyOwner |
 L | updateMaxWallet | External | | | onlyOwner |
 L | updateMaxTransactionAmount | External | | • | onlyOwner |
 L | updateMarketingFee | External | | • | onlyOwner |
```

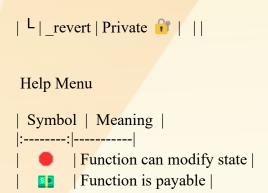


```
| updateMarketingWallet | External | onlyOwner |
 └ | setAutomatedMarketMakerPair | Private 🔐 | ● | |
 | excludeFromFee | External | | | onlyOwner |
 | excludeFromMaxTransactionAmount | External | | | onlyOwner |
 └ | transfer | Internal 🔒 | ● | |
 └ | takeFee | Private 🔐 | 🛑 | lockTheSwap |
 └ | swapTokensForBaseToken | Private 🔐 | ● | |
 └ | addLiquidity | Private 🔐 | 🛑 | |
 **ERC20** | Implementation | Context, IERC20, IERC20Metadata |||
L | < Constructor > | Public | | | NO | |
 L | name | Public | | NO | |
 L | symbol | Public ! | NO! |
 L | decimals | Public | | NO |
 L | totalSupply | Public | | NO |
 L | balanceOf | Public | | NO | |
 L | transfer | Public | | | NO | |
 L | allowance | Public | | NO | |
 L | approve | Public ! | | NO! |
 L | transferFrom | Public | | NO | |
 L | decreaseAllowance | Public | | NO | |
 L | transfer | Internal 🔒 | 🛑 | |
 └ | _mint | Internal 🔒 | ● ||
L | spendAllowance | Internal | | |
 └ | beforeTokenTransfer | Internal 🔒 | 🛑 | |
 └ | afterTokenTransfer | Internal 🔒 | ● | |
| **IERC20** | Interface | |||
L | totalSupply | External | | NO | |
L | balanceOf | External | | NO | |
 L | transfer | External | | NO | |
L | allowance | External | | NO | |
L | approve | External | | NO | |
 L | transferFrom | External | | NO | |
| **IERC20Metadata** | Interface | IERC20 |||
```



```
L | name | External | NO |
 L | symbol | External | | NO | |
 | decimals | External | | NO | |
| **Context** | Implementation | |||
 L | msgSender | Internal 🔒 | | |
 L | msgData | Internal | | | |
**Ownable** | Implementation | Context ||
| L | <Constructor> | Public | | | NO | |
 L owner | Public | NO | |
 L | checkOwner | Internal | | | |
 I renounceOwnership | Public | | onlyOwner |
 L | transferOwnership | Public | | | onlyOwner |
 └ | transferOwnership | Internal 🔒 | ● ||
**SafeERC20** | Library | |||
 L | safeTransfer | Internal 🔒 | 🛑 | |
 └ | safeTransferFrom | Internal 🔒 | 🛑 | |
 └ | safeIncreaseAllowance | Internal 🔒 | ● | |
 └ | safeDecreaseAllowance | Internal 🔒 | 🛑 | |
 L | safePermit | Internal 🔒 | 🛑 | |
 L | callOptionalReturn | Private 🦸 | 🛑 | |
| **IERC20Permit** | Interface | |||
| L | permit | External | | | NO | |
L | nonces | External | | NO | |
L | DOMAIN SEPARATOR | External | | | NO | |
| **Address** | Library | |||
| L | isContract | Internal 🔒 | | |
 L | functionCall | Internal 🔒 | ● ||
 └ | functionCall | Internal 🔒 | 🛑 | |
 └ | functionCallWithValue | Internal 🔒 | ● | |
 └ | functionCallWithValue | Internal 🔒 | ● | |
 └ | functionStaticCall | Internal 🔒 | | |
 L | functionStaticCall | Internal | | | |
 └ | functionDelegateCall | Internal 🔓 | ● | |
 └ | functionDelegateCall | Internal 🔒 | ● | |
 └ | verifyCallResult | Internal 🔒 | | |
```







### **STATIC ANALYSIS**

```
Address, functionelestactilidedress, bytes) (contracts/Token solema) 522) is never used and should be removed address, functionelestactilidedress, bytes) (contracts/Token.solema) 522) is never used and should be removed address, functionataiticallidedress, bytes) (contracts/Token.solema) 529) is never used and should be removed address, sunctionataiticallidedress, bytes, string) (contracts/Token.solema) 529) is never used and should be removed Address, sunctionataiticallidedress, bytes, string) (contracts/Token.solema) 529) is never used and should be removed Address, sunctionataiticallidedress, bytes, string) (contracts/Token.solema) 529) is never used and should be removed Address, sunctionataitically (contracts/Token.solema) 529) is never used and should be removed Science of the soleman of the soleman
```

Result => A static analysis of contract's source code has been performed using slither,

No major issues were found in the output



## **FUNCTIONAL TESTING**

#### Router (PCS V2):

0xD99D1c33F9fC3444f8101754aBC46c52416550D1

All the functionalities have been tested, no issues were found

#### 1- Adding liquidity (passed):

https://testnet.bscscan.com/tx/0xa8d9f0588eecc240b9c7fab7b3e1cc599aa1b711a bc381903cc43172a1e6739b

#### 2- Buying when excluded (0% tax) (passed):

https://testnet.bscscan.com/tx/0x472a220e01da885f1e3dca38835708c76976aafe 9e5d7856cf6e544c293a92e9

#### 3- Selling when excluded (0% tax) (passed):

https://testnet.bscscan.com/tx/0x8fc1cfc3a34fff5e09d702e149abde90696d469e4 8cb85e998e9235e2bada234

#### 4- Transferring when excluded from fees (0% tax) (passed):

https://testnet.bscscan.com/tx/0xd30f5283c89c63b898ac743de015a8ea8b7eba8 2cf54a57ebaa8e7e872e72a78

#### 5- Buying when not excluded from fees (up to 20% tax) (passed):

https://testnet.bscscan.com/tx/0x494a72970d3255e88153e244f2ccc756af60eec6 329a802b42ab55da98b21f72

#### 6- Selling when not excluded from fees (up to 20% tax) (passed):

https://testnet.bscscan.com/tx0x5d8f1f884d5fc17ede400b8afa010cb40e2088694 3b85fc1dab1eff2e9243a16



## **FUNCTIONAL TESTING**

### 7- Transferring when not excluded from fees (0% tax) (passed):

https://testnet.bscscan.com/tx/0x9554362a05942a2cd5af8680480ab 3ecafaad02698a8b712d869cc6bc525a9f9

### 8- Internal swap (passed):

All fee wallets received BNB + auto liquidity

https://testnet.bscscan.com/tx/0x5d8f1f884d5fc17ede400b8afa010cb 40e20886943b85fc1dab1eff2e9243a16



### MANUAL TESTING

# Centralization - Max amount for buy/transfer/wallet/sells

Severity: High

Function: updateMaxTransactionAmount - updateMaxWallet

Status: Not Resolved

#### Overview:

The smart contract allows the owner to set maximum limits for buy, transfer, wallet amounts, and sell transactions. The owner can set these limits to as low as 1 wei (0.0000000000000000001 PEPA tokens), which could potentially disable buy, transfer, and sell operations for the PEPA token. This high degree of control by the contract owner introduces centralization risks and could impact the token's overall functionality.

```
function updateMaxTransactionAmount(uint256 _maxTransactionAmount) external onlyOwner {
   require(_maxTransactionAmount > 0, "maxTransactionAmount > 0");
   emit UpdateMaxTransactionAmount(_maxTransactionAmount, maxTransactionAmount);
   maxTransactionAmount = _maxTransactionAmount;
}

function updateMaxWallet(uint256 _maxWallet) external onlyOwner {
   require(_maxWallet > 0, "maxWallet > 0");
   emit UpdateMaxWallet(_maxWallet, maxWallet);
   maxWallet = _maxWallet;
}
```

#### Suggestion

To mitigate this centralization issue, we propose the following options:

- Renounce Ownership: Consider relinquishing control of the smart contract by renouncing ownership. This would remove the ability for a single entity to manipulate the maximum limits, reducing centralization risks.
- Multi-signature Wallet: Transfer ownership to a multi-signature wallet. This would require multiple approvals for any changes to the maximum limits, adding an additional layer of security and reducing the centralization risk.



### MANUAL TESTING

## Logical – Router can be updated to a new address

Severity: High

function: updateUniswapV2Pair

Status: not resolved

Overview:

The smart contract allows the owner to update the mainRouter which is the contract that is used to add liquidity for the token during an internal swap. Setting mainRouter to a new contract that has some unknowns issues or doesn't support adding liquidity operations, can cause unknown issues for sells (potentially disabling them)

```
function updateUniswapV2Router(address newAddress) public onlyOwner {
    require(
        newAddress != address(mainRouter),
        "The router already has that address"
);
    emit UpdateUniswapV2Router(newAddress, address(mainRouter));
    mainRouter = IUniswapV2Router02(newAddress);
    address _mainPair = IUniswapV2Factory(mainRouter.factory()).createPair(
        address(this),
        baseTokenForPair
);
    mainPair = _mainPair;
    _setAutomatedMarketMakerPair(mainPair, true);
}
```

#### Suggestion

To mitigate this centralization issue, we propose the following options:

- Renounce Ownership: Consider relinquishing control of the smart contract by renouncing ownership. This would remove the ability for a single entity to manipulate the router, reducing centralization risks.
- Multi-signature Wallet: Transfer ownership to a multi-signature wallet. This would require
  multiple approvals for any changes to the mainRouter, adding an additional layer of security
  and reducing the centralization risk.



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